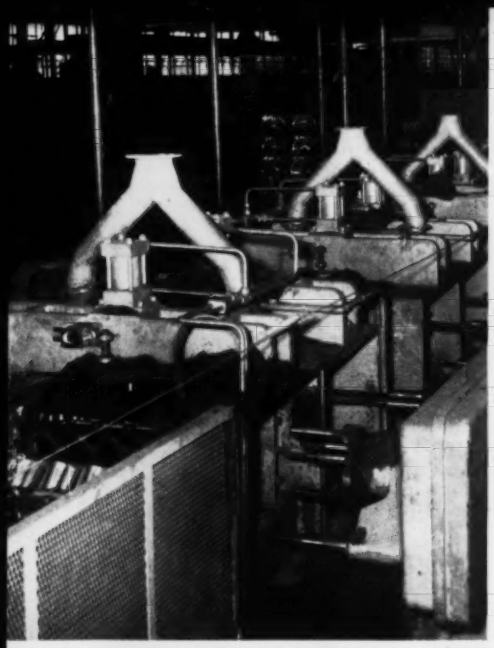
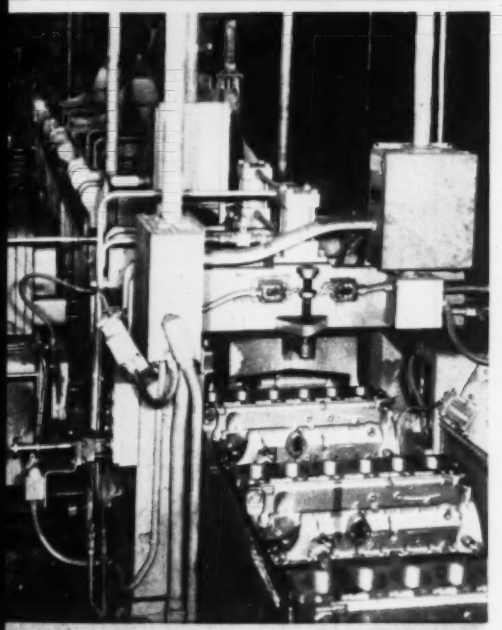
NOVEMBER 9, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION





What the Steel Case Will Mean to Other Metalworking Negotiations

3 Ways to Beat the Manpower Crisis

It Pays to Woo Your Distributor

A New Tool Helps Electrolytic Machining Tackle Tougher Shapes

Welding Helps Casters Cut Costs

U. S. Stockpiling: Which Way Now?

V-8 line turns to 6s, as . . .

Falcon Revs Up

When Ford engineers decided to make their compact car engines on rebuilt transfer machines, they saved an estimated 60 to 75 per cent of the equipment cost. Other benefits: Less run-in trouble than they could expect on a new line, and tolerances are closer than those required for V-8s (Page 154)

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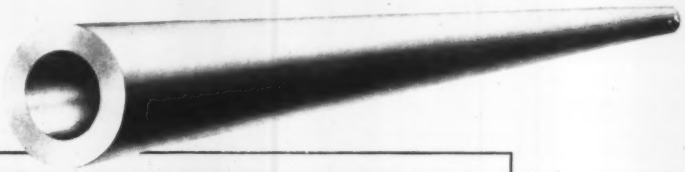

How B&W JOB-MATCHED TUBING reduces fabrication costs in pressure tube applications

. . . Uniform mechanical properties—provide ease of fabrication . . . reduces fabrication costs.

. . . Close tolerances—provide ease of threading through tube sheets, baffles and headers . . . reduces fabrication costs.

. . . Desired lengths—long or short, eliminates field welding or cutting . . . reduces fabrication costs.

These are just a few of the reasons why it pays to specify B&W Job-Matched Pressure Tubing. And it is available in a complete range of sizes and in a full range of carbon, alloy and stainless steels. Call the tubing specialist at your local B&W District Sales Office, or write for Bulletin TB-417 for full information. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

B&W

THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

TA-9028-G4

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

This Week in STEEL

The Metalworking Weekly

November 9, 1959 Vol. 145—No. 19

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Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED OCT. 31	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	114†	116	117	150

†Preliminary.

Cutbacks in the auto industry, induced by steel shortages, are taking their toll on STEEL's industrial production index. The latest reading is the lowest since the model changeover period, and it could go lower.

Details on Page 127

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED NOV. 7	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	65,000*	103,013†	118,793	125,279

*Estimated. †Preliminary.

General Motors Corp. is practically shutdown for lack of steel. Chrysler Corp. is operating at about two-thirds of its planned level. Ford Motor Co. is going on three and four day weeks to stretch its metal supplies. The Little Two still have not been forced to cut back.

Details on Page 124

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED NOV. 8	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	382*	371	362	2,011
Index (1947-49=100)	23.8*	23.1	22.5	125.2
Percentage of capacity	13.5*	13.1	12.8	74.5

*Estimated by STEEL; comparative figures reported by AISI.

About 5.6 million tons of steel were produced during the first 16 weeks of the strike, an average of 35,000 tons a week. This is the industry's smallest output for any like period since the depression year 1933.

Details on Page 202

STEEL SCRAP PRICE COMPOSITE

	NOV. 4	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$45.33	$44.33	$43.00	$42.33

Steelmaking grades of scrap advanced on a combination of factors including continued strong export demand, tapering in amount being generated, and prospects that mills will be forced to use a higher percentage in their melts this winter.

Details on Page 214

FINISHED STEEL PRICE INDEX

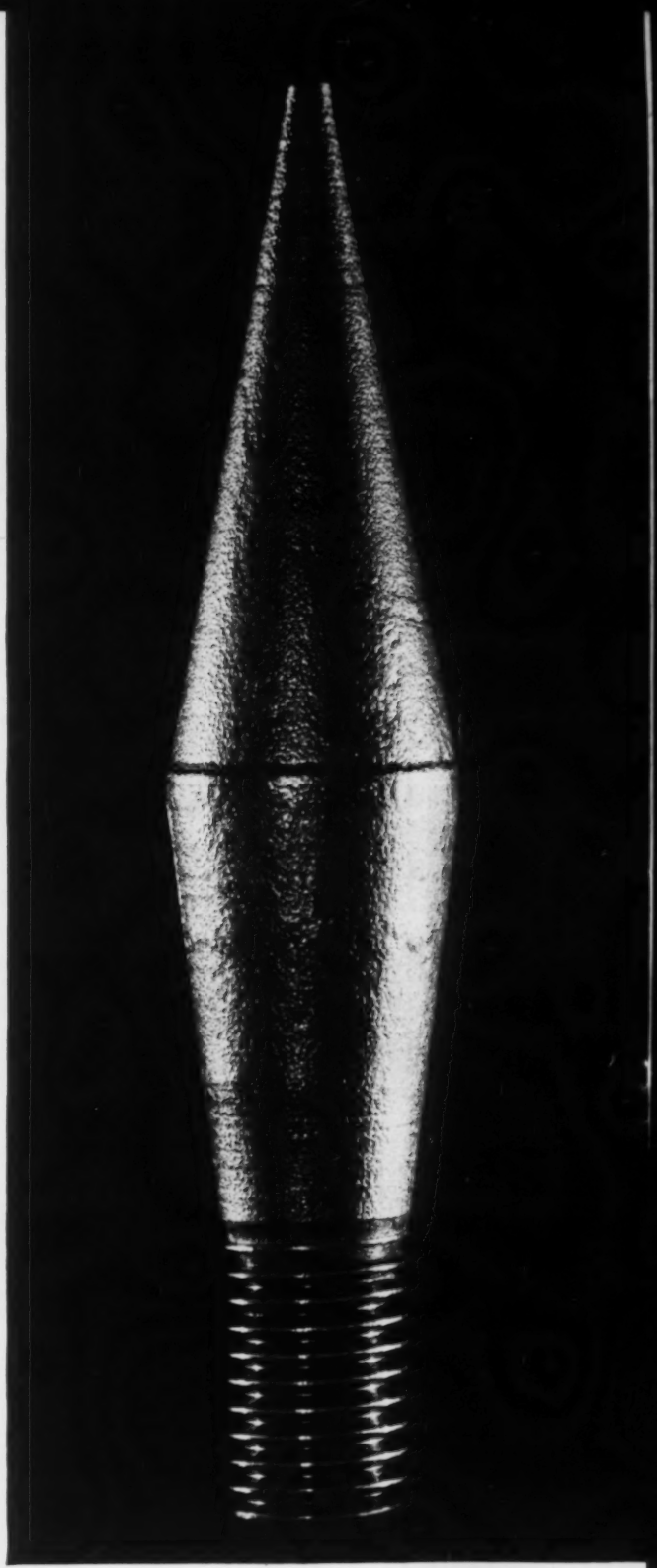
	NOV. 3	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.8	186.8	186.8	186.8

Industry negotiators remain firm in their position that any new contract must be noninflationary and preclude any necessity for raising the present steel price level. Imported steel prices continue to advance.

Details on Page 203

Not a New Missile

it's a special fastener



It looks like it's ready to blast-off from Cape Canaveral. But see the threads? They give it away for what it really is—a fastener. And a very special kind, made by Bethlehem.

Our customer uses this special fastener as the point in a grip hook for steam log loaders. It's got to be strong and hard and tough. That's why we hot-forge it from a special alloy steel and heat-treat it. Other manufacturing operations: trimming, descaling, threading.

Forgings, bolts, nuts, rods, stampings—Bethlehem makes every kind of steel fastener specialty. Headed, threaded, pointed, bent, or slotted. Machined, punched, or drilled.

The nearest Bethlehem sales office will give you full details. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

NEW

proven design features . . .

Here is the second in the entirely new, field-tested line of heavy duty Nebel Lathes, extending Nebel economies even further into the heavy duty field.

The rugged, proven design Nebel Model 2516 Engine Lathe is built to the complete A.S.A. standards and tolerances of accuracy for engine lathes. It offers you more accuracy, more power, more and higher spindle speeds than ever before available from Nebel.

- Heavy duty 3-bearing spindle with zero precision bearings.
- 18 spindle speeds through complete gear range . . . up to 1500 RPM . . . streamlined speed selection.
- 60 feeds, 60 thread changes . . . all directly read.
- Automatic lubrication.
- Wide design carriage with 146 square inches of bearing surface on bed ways.
- Double-wall one piece totally enclosed apron with simplified controls.
- End gearing totally enclosed in self-lubricating housing.
- Power traverse heavy duty tailstock with rugged thrust lock.
- Rigid box girth design bed . . . hardened and ground steel bedways.

Write for new, fully descriptive Bulletin No. 213.

Nebel Lathe Division • Nebel Machine Tool Corp.
3405 Central Parkway, Cincinnati 25, Ohio

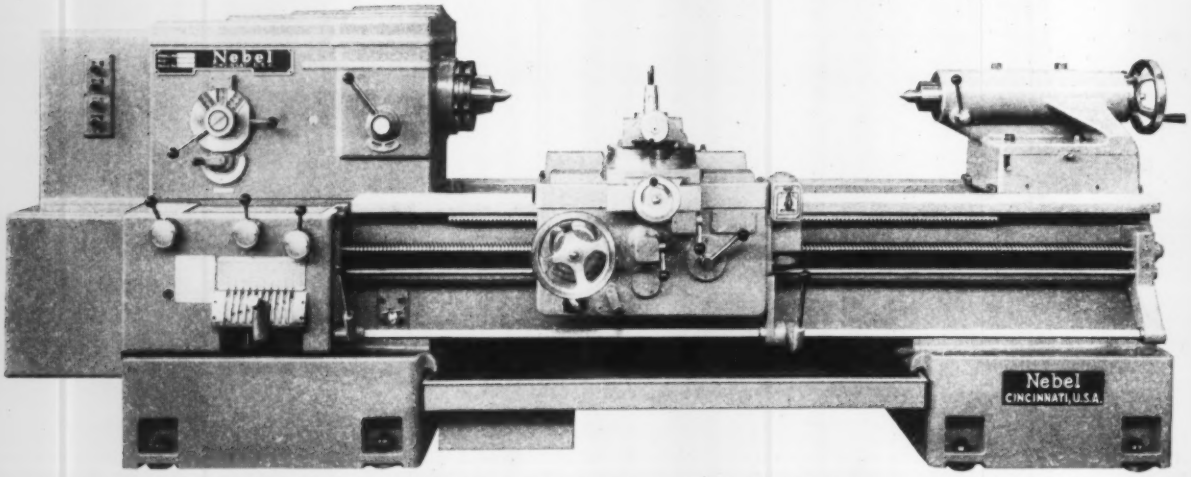
Other entirely new, proven design Nebel Lathes now available:

- Heavy Duty Model 2013 (Bulletin 212)
- Standard Duty Model 2516-20 (Bulletin 214)
- Heavy Duty Extension Bed Gap Lathe Model HXB 26/45 (Bulletin 211)

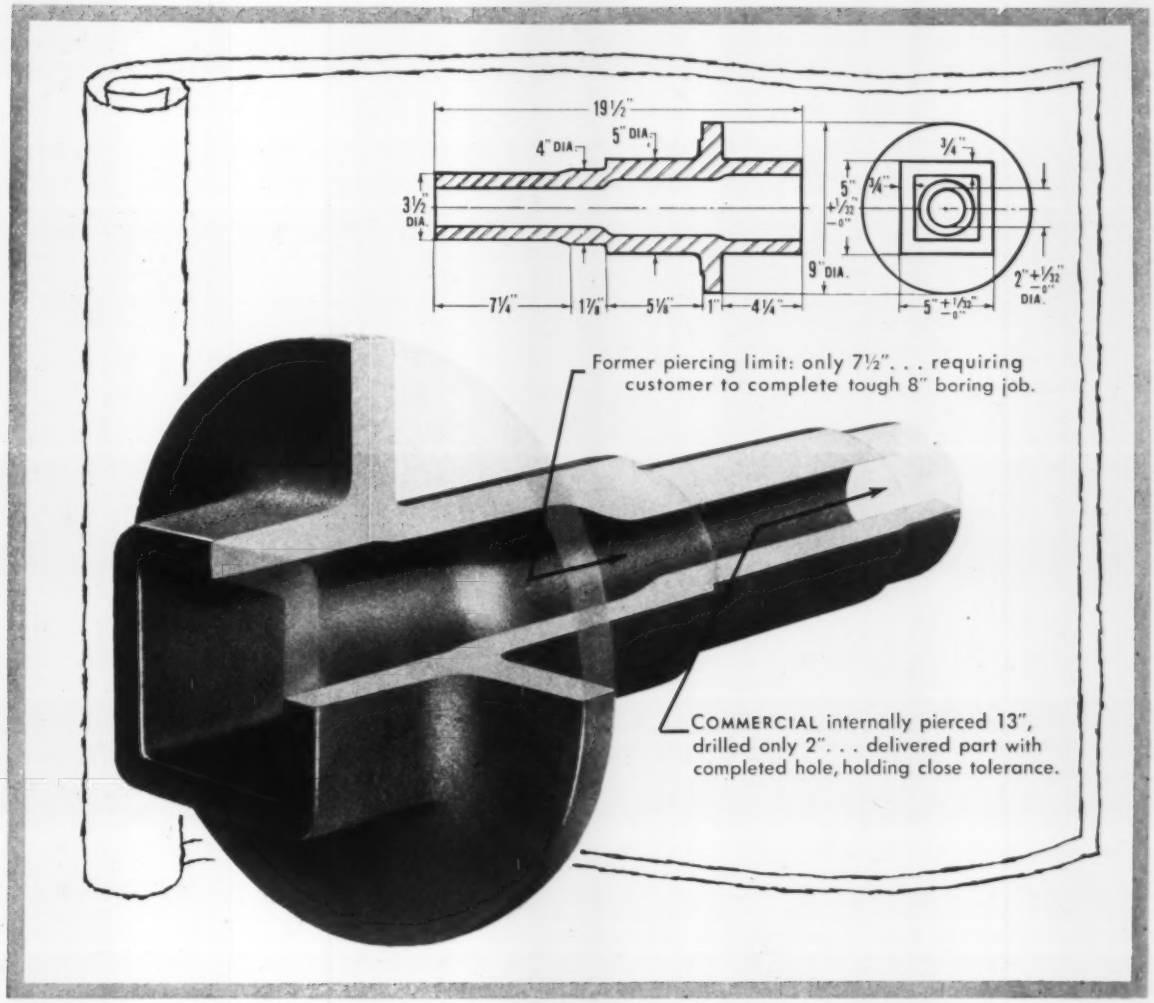
NEBEL

HEAVY DUTY ENGINE LATHE

entirely new, proven design



NEBEL MODEL 2516 HEAVY DUTY ENGINE LATHE



"Task-Forging" Pierces Holes 60% Deeper

Advanced upsetting techniques at COMMERCIAL now permit internal piercing of forgings well beyond the commonly-accepted 7 to 1 length-to-diameter limit.

Good example of new advantages: a 39 lb. rear axle spindle. Formerly the customer had to drill 8" of the 1½" I. D. after forging—a tough job with a close concentricity tolerance.

Now "Task-Forged", the part leaves COMMERCIAL's versatile, integrated plant with completed bore . . . with a substantial savings in metal and machining.

For COMMERCIAL's "Task-Forge" engineering-upsetting-boring team, the improvement was a "1-2-3" routine:

(1) The square end, flange and round end were upset from a 2¾" bar of SAE 8640 steel.

(2) The internal hole of varying I. D. was punched 13". . . over 60% deeper than before!

(3) The remaining 2" of the 1½" I. D. was precision drilled in the same plant.

Like to see what the "Task-Forging" concept can do for you? Just send a sketch or drawing of your part to Dept. L-46.

COMMERCIAL SHEARING & STAMPING COMPANY

YOUNGSTOWN 1, OHIO

COMMERCIAL shearing & stamping

Handling a hot job at a cool $1400-a-year saving

They don't spare the belts around busy foundries like this one in the Midwest. And their shakeout conveyor was in a specially hot spot—handling smoking sand at temperatures well over 250°F, occasionally reaching a near-incandescent 450°F. Little wonder belt life averaged only 43 days.

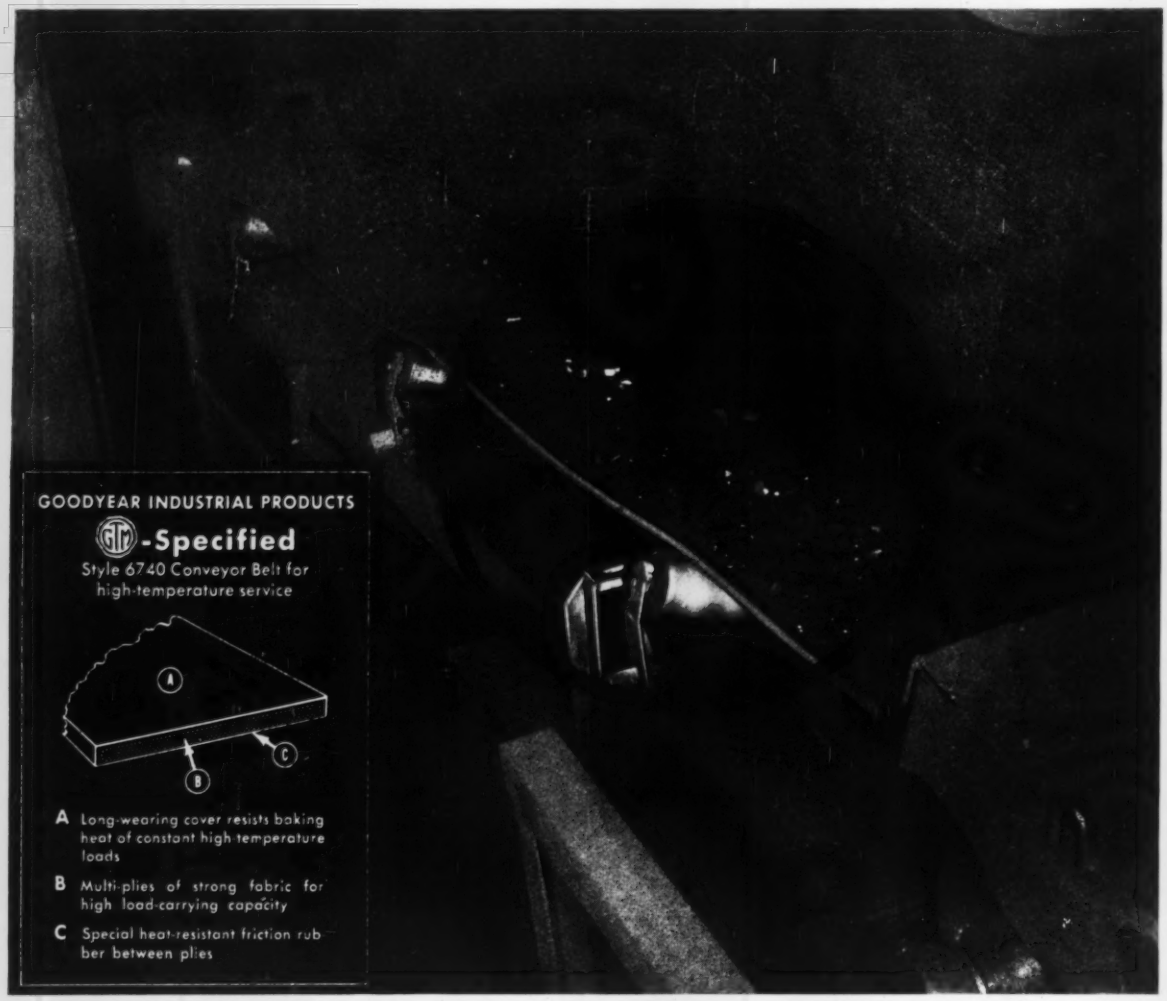
But that was before the G.T.M.—Goodyear Technical Man—appeared on the scene. His recommendation: Style 6740 conveyors especially designed to resist the usual cracking, charring effects of "cooking" heat.

The results: carefully kept records showed a succession of 5 of the G.T.M.'s belts averaging 154 days apiece—*more than 3½ times previous service.* And that meant a yearly saving of exactly $1,435.40.

Isn't this the kind of dollars-and-cents improvement you'd like to make in your shop? If it takes industrial rubber, the G.T.M.'s your man. Contact him through your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

• • •

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and non-rubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*


GOODYEAR INDUSTRIAL PRODUCTS
GTM-Specified
Style 6740 Conveyor Belt for high-temperature service
A
B
C
A Long-wearing cover resists baking heat of constant high-temperature loads
B Multi-plies of strong fabric for high load-carrying capacity
C Special heat-resistant friction rubber between plies

CONVEYOR BELTS BY

GOODYEAR

THE GREATEST NAME IN RUBBER

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

November 9, 1959

Monobromotrifluoromethane

That is the name of a new chemical developed by the Army for fighting liquid fuel and electrical fires.

But if you have a fire, holler for an extinguisher instead of: "Quick! Bring the monobromotrifluoromethane!"

On the Managers' Lists

Fred B. Crandall, general sales manager, T. D. Williamson Inc. (pipeline tools) Tulsa, Okla., writes: "Your Program for Management articles are some of the best we have found in the management publication field.

"Of all the magazines we get, STEEL is one of the most called for . . . our general manager insists upon seeing it. We thought you'd be happy to know that our chief engineer, general manager, and I, all feel that STEEL is one of the most valuable we receive."

Mr. Crandall, watch next week's issue. Here's a preview.

Will the Machine Replace You?

What will your job be like ten years from now? Will it even exist? Those and other questions will be explored next week in "Manager of the Future," the last of ten articles in this year's management series on the changing role of the metalworking manager.

Confidentially, News Editor Bill Dean assures us that metalworking will still need its managers—but your job will be tougher and more complex than ever before. However, if you keep pace, you'll be in command of the refined tools and techniques required to meet Space Age challenges.

Our Cup Runneth Over

"Your story of the Bendix General Purpose Digital Computer that wrote a book is fascinating," comments Si Wakesberg, secretary, Metal Divisions, National Association of Waste Material Dealers Inc., New York. "What limitless possibilities for editors and writers.

"We could all go to Florida and sun ourselves while computers knock out copy. There's one little rub. Some wiseacre engineer is going to teach the computers to drink martinis, and they'll fall heir to all human weaknesses. They'll make typographical errors, withhold signals right up to deadlines, and may even go in for such oddly human things as market predictions.

"If we can just keep those computers contented in their little field, it will be a great day for *Homo sapiens*."

Did You Know . . .

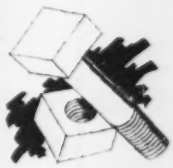
. . . It takes 4950 lb of raw materials to make an ingot ton of carbon steel? Do you know the ingredients? Here they are in approximate quanties: 2130 lb of iron ore, 970 lb of coke, 500 lb of limestone, 1150 lb of scrap, about 30 lb of ferroalloys, and 170 lb of coal.

A New Wrinkle

There's a lot of talk about standards, specifications, and definitions. How about this item from H. Allen Smith's book *Write Me a Poem, Baby*, published by Little, Brown & Co., Boston:

"A teacher in a Richmond school decided to test the descriptive powers of her English pupils. She placed an assortment of hardware on a table and instructed the children to choose any two items and describe them in an essay. One little girl's choice:

Nut and Bolt

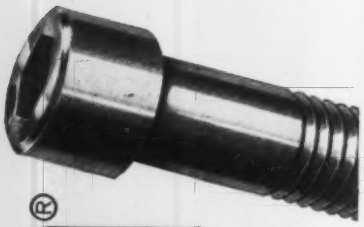


"A bolt is a thing like a stick of hard metal such as iron with a square bunch on one end and a lot of scratching wound around the other end. A nut is similar to the bolt only just the opposite being a hole in a little chunk of iron sawed off short with wrinkles around the inside of the hole."

'Surest Way to Ruin'

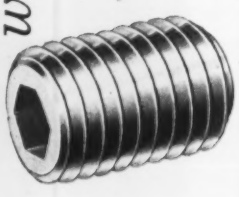
"I have read with interest the comments on 'Who Pays for Engineering?'" (STEEL, Aug. 31, p. 25), writes Edward A. Brass, B&B Engineering Corp., Norwood, La.

"The records reveal that the surest way to ruin is to eliminate this engineering . . . One only



B-RIGHT-ON®
SOCKET SCREW PRODUCTS
1835 Reading Road Cincinnati 2, Ohio

You can do better with...



has to read the records of the fire alarm telegraph industry to find out what happens when this so called free engineering is eliminated. For some 70 years we had one company furnishing practically all this equipment. Today, the municipal fire alarm telegraph industry is about as obsolete as the horse and buggy."

Why Acton's Fee Goes Up

Acton Chance, the industrial detective, is getting happier by the minute. In the Oct. 19 Servicenter we presented his comments on a reader's request for eight copies of his report: "The Case of the Vanishing Profits." (STEEL, Sept. 28, p. 82.) The reader wanted copies to mail to eight competitors. Acton saw possibilities of a chain letter growing out of that request.

Tracing a chain letter to its starting point is one hell'uva job. Though we haven't investigated it, we think a chain may have been started. Miss June Schilens of our Reprint Dept. tells us she has filled nationwide requests for more than 4500 copies of the article on price fighting's role in vanishing profits.

Acton's earlier studies have drawn worldwide acclaim. "The Case of the Vanishing Jobs" (STEEL, Apr. 6, p. 99) has drawn requests for more than 30,000 reprints, and his "Case of the Vanishing Taxes" (STEEL, May 11, p. 100) has drawn inquiries for 15,000 copies. And requests are still coming in.

Acton's happy; the editors are happy; but the Accounting Dept. says if Acton's going to hike his fee for each job, it wants advance notice. Seems his fee increases raise problems with payroll budgets.

We don't mind.

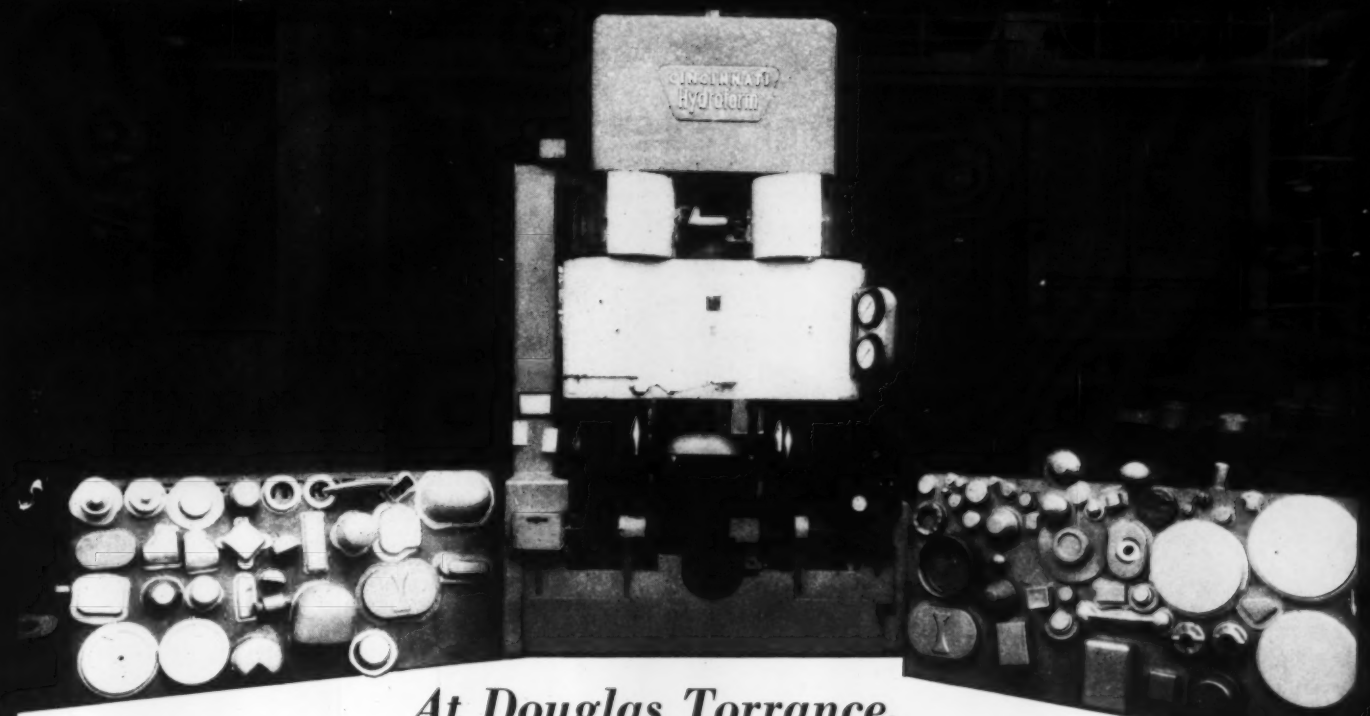
Laboratory in a Box

A simply designed piece of steel, the gage block, is industry's primary standard of length. With the July announcement of the international agreement to change the inch to 25.4 mm, we had to add 2 millionths of an inch per inch to our gage block calibration, and the English subtracted 2 millionths.

We're reminded of a whimsical definition of the gage block read by Mary E. Hoskins, metrologist, Sheffield Corp., Dayton, Ohio, at the Instrument-Automation Conference in Chicago:

Ode to a Gage Block

"Hardened tool steel, polished and lapped,
Size to a millionth, parallel and flat.
Measured by light wave or electronically,
Used to build planes which fly supersonically.
Basis of production interchangeability,
For laboratory instruments—great versatility.
Simple in design, true, and dependable,
Economical if cared for, definitely commendable."



At Douglas Torrance, the major source for sheet metal draw work is the **Cincinnati**

The state of Hydroforming art at the Torrance facility of Douglas Aircraft Co., Inc., El Segundo Div., has progressed to the point that their 26″ Hydroform® is the major source for sheet metal draw work. The photo above shows their Hydroform, surrounded by display panels of typical parts produced. These display panels are kept at the machine site for the edification of visiting tooling and methods engineers. Note the variety of complex shapes and the extreme range of part sizes, all produced on this machine.

Many parts formerly fabricated by welding and hand finishing, or produced by drop hammer, conventional deep drawing, or spinning, are now Hydroformed complete in one or two draws. Improved part quality, and incalculable savings in tooling and labor costs, scrap loss and production time have resulted.

Look into the many advantages offered by Hydroforming for producing your sheet metal parts and components. For full information, call in a Meta-Dynamics Division field engineer.

META-DYNAMICS DIVISION
Machines for Metal Forming and Heat Treating

THE CINCINNATI MILLING MACHINE CO.
Cincinnati 9, Ohio, U.S.A.

CINCINNATI

Small shapes are drawn on the 26″ Hydroform at Torrance, by using the ingenious multiple punch and draw ring set shown below. This tooling is used for the simultaneous forming of up to four parts, or for the production of unusually small parts. The main draw ring (Fig. 1) will accept insert-type draw rings, and punches up to 3″, 4″, 5″ and 6″ in diameter. Fig. 2 shows a right-hand and left-hand part punch, and draw ring, ready for insertion in the tool set. Tools can be changed in two minutes. Fig. 3 shows the parts produced.

Fig. 1

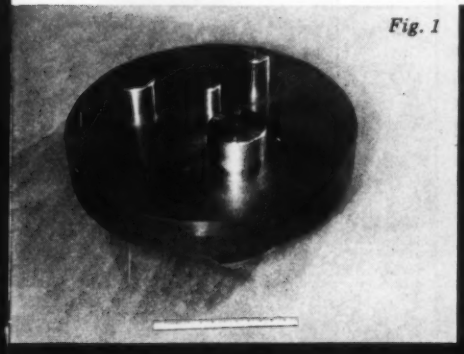


Fig. 2

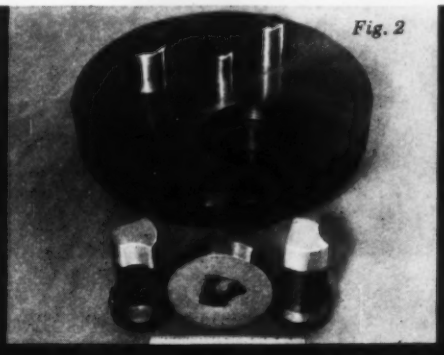
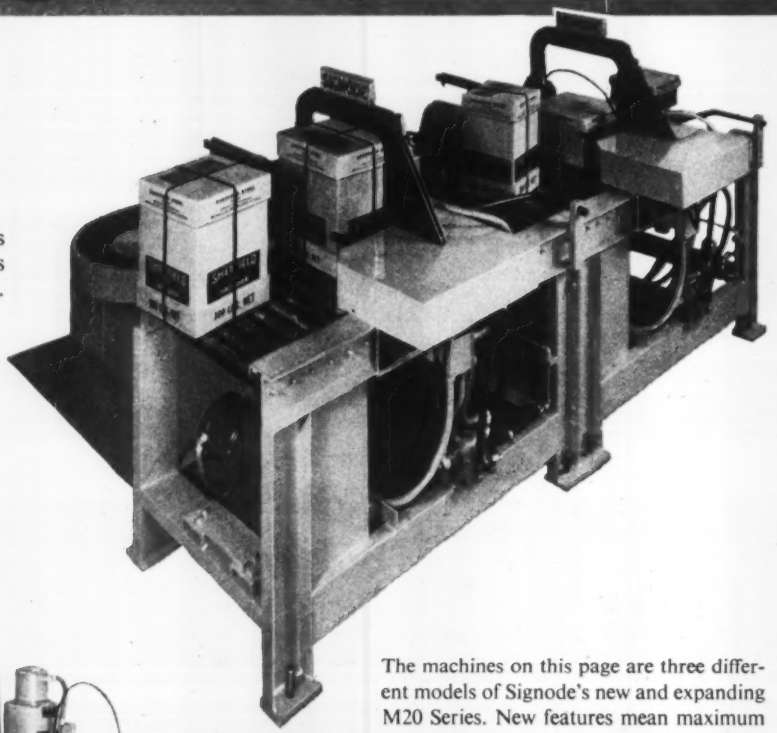


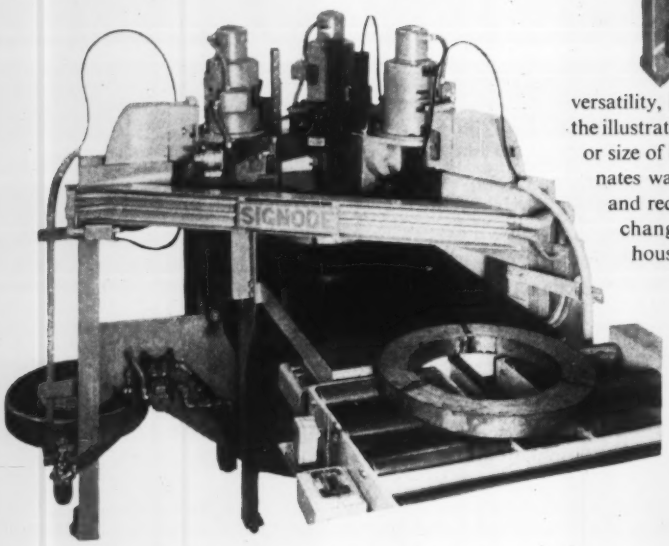
Fig. 3

Signode machines

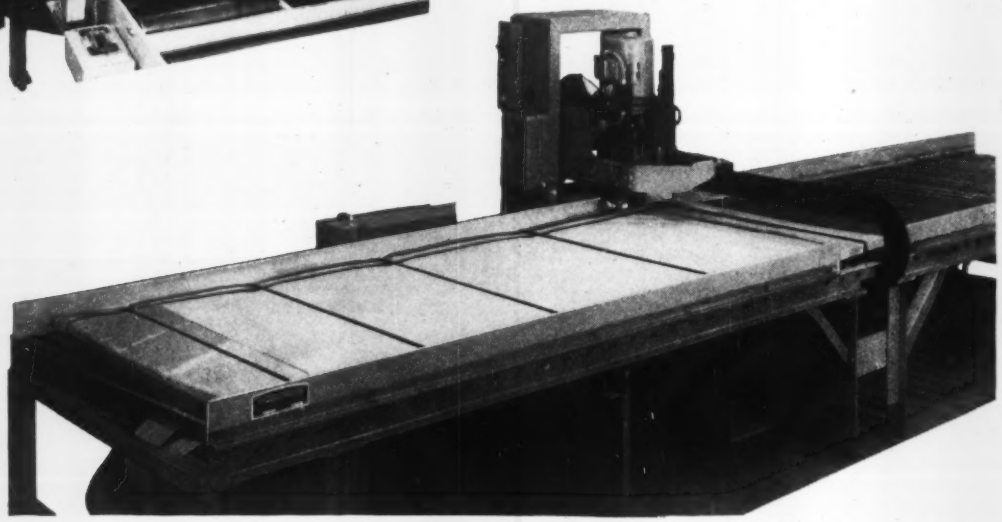


Operatorless
cross-strapping of nail cartons
in mixed sizes.

Operatorless strapping of strip
steel coils, 3 straps simultaneously,
up to 1,000 coils per hour.

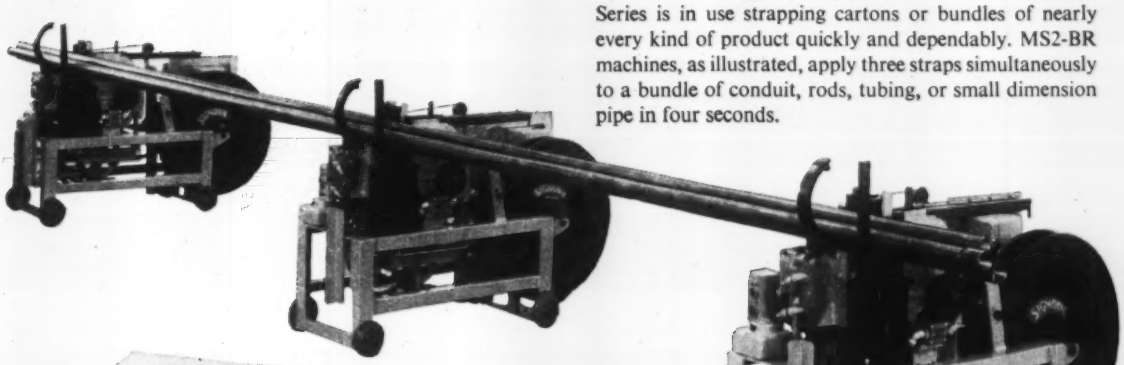


The machines on this page are three different models of Signode's new and expanding M20 Series. New features mean maximum versatility, long trouble-free life, and minimum maintenance. As the illustrations show, automatic strapping of practically any shape or size of bundle or container is possible. Overlap control eliminates waste of strap. Tension is easily and accurately pre-set, and requires no further adjustment unless type of package is changed. Vital working parts are protected by a sealed housing and run in a bath of oil. With an M20, strapping can be applied vertically or horizontally...any type of Signode PSM grade strapping can be used, in sizes from ⅜" to ¾". Seals can be lithographed with your trademark in color. Operation can be completely automatic (operatorless), or semi-automatic (push-button controlled).

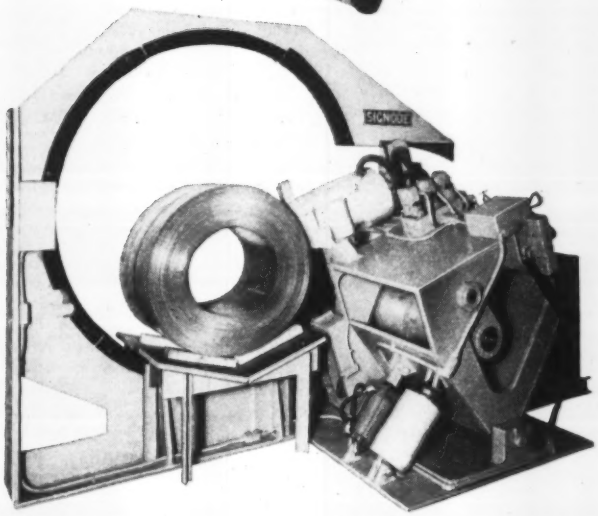


Operatorless strapping
of plastic sheet packs.
Number of straps
per pack is optional.

reduce packaging costs



Push-button strapping of pipe. This "work horse" M2 Series is in use strapping cartons or bundles of nearly every kind of product quickly and dependably. MS2-BR machines, as illustrated, apply three straps simultaneously to a bundle of conduit, rods, tubing, or small dimension pipe in four seconds.



Operatorless circumferential strapping of aluminum coils. Strapping is automatically centered on coils from 30″ to 72″ O.D. Capacity is 300 to 400 coils per hour. Other MH Series machines put 300 to 360 straps per hour on hot or cold strip steel coils or rod or wire coils...have been proved dependable in as much as ten years of the hardest kind of steel mill service.

Every day hundreds of plants prove their economy and dependability

Signode machines strap faster and at less cost—and do it dependably, with uniform tension on every strap. Tensionable steel strapping is low in cost to begin with...and high in strength to ship with. Signode has unparalleled experience in building and applying over 30 different types of these machines. Improved flow, less waste, better handling, safer transit, and lower costs nearly always result. Signode Service includes operator training and fast mechanical service on a local basis, nationwide. All of these machines are available on either an annual rental or single payment basis. It will pay you to talk to the Signode man near you, or write:

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2645 N. Western Avenue, Chicago 47, Illinois

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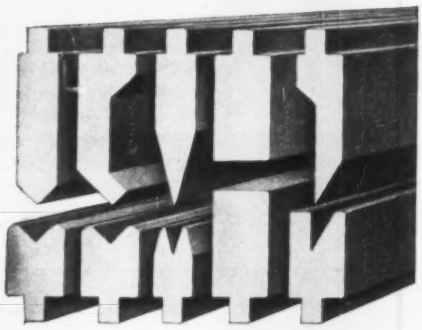

CHICAGO®
*Induction Hardened** PRESS BRAKE DIES

This organization of local distributors offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

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*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

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Press Brakes, Press Brake Dies
Straight-Side-Type Presses

Hand and Power Bending Brakes
Special Metal-Forming Machines

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MANUFACTURING CO.
7458 South Loomis Boulevard
Chicago 36, Illinois

CALENDAR
OF MEETINGS

Nov. 9-11, American Petroleum Institute: Annual meeting, Conrad Hilton, Palmer House, and Congress Hotels, Chicago. Institute's address: 50 W. 50th St., New York 20, N. Y. President: Frank M. Porter.

Nov. 9-11, Steel Founders' Society of America: Technical and operating conference, Carter Hotel, Cleveland. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Nov. 9-12, National Electrical Manufacturers Association: Annual meeting, Traymore Hotel, Atlantic City, N. J. Association's address: 155 E. 44th St., New York 17, N. Y. Managing director: Joseph F. Miller.

Nov. 10-13, National Association of Aluminum Distributors: Annual meeting, Santa Barbara-Biltmore Hotel, Santa Barbara, Calif. Association's address: 1900 Arch St., Philadelphia 3, Pa. Secretary: R. Bruce Wall.

Nov. 11-12, American Zinc Institute Inc.: Plating symposium, Statler-Hilton Hotel, Detroit. Institute's address: 60 E. 42nd St., New York 17, N. Y. Executive vice president: J. L. Kimberly.

Nov. 11-15, National Association of Waste Material Dealers Inc.: Fall meeting, Diplomat Hotel, Hollywood Beach, Fla. Association's address: 271 Madison Ave., New York 16, N. Y. Managing director: Clinton M. White.

Nov. 15-19, National Screw Machine Products Association: Fall meeting, Americana Hotel, Miami Beach, Fla. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Nov. 17-20, Packaging Machinery Manufacturers Institute Show: Coliseum, New York. Information: Hanson & Shea Inc., 1 Gateway Center, Pittsburgh 22, Pa.

Nov. 19, National Industrial Conference Board: Meeting for all associates, Conrad Hilton Hotel, Chicago. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Nov. 23-25, American Management Association: Research and development conference, Ambassador Hotel, Los Angeles. Association's address: 1515 Broadway, New York 36, N. Y.

Nov. 29-Dec. 3, American Institute of Steel Construction: Annual meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: 101 Park Ave., New York 17, N. Y. Executive vice president: L. Abbett Post.

Nov. 29-Dec. 4, American Society of Mechanical Engineers: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

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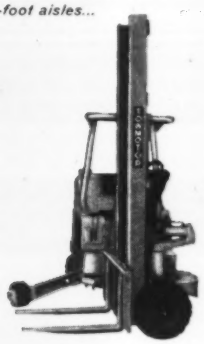
THE ONE-MAN-GANG

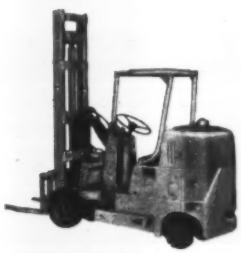
"Naro-Aisle-Stack" TRUCK

Stacks either side in 6-foot aisles...



Increases storage capacity up to 35% . . . gives you an "extra warehouse" free

Newest idea in fork lift trucks!



...also performs like standard lift trucks

The "Naro-Aisle-Stack" series is a Towmotor "first" that offers an entirely new mass handling technique in fork lift truck operation.

Equipped with hydraulically operated outriggers, Towmotor "Naro-Aisle-Stack" trucks perform right and left angle stacking in aisles 6 feet wide, or from four to six feet narrower than lift trucks usually require.

In addition, they also perform all of the functions of a regular fork lift truck. They pick up and lift heavy loads at speeds of 70 feet per minute. Their built-in maneuverability and pivot-action make it possible to operate in congested storage areas and turn sharp corners with the agility, safety and comfort only a sit-down type truck offers.

The new Towmotor "Naro-Aisle-Stack" truck is made possible only by the use of the exclusive Towmotor Towmostatic Drive — the drive that eliminates the clutch, the transmission, the drive line, the differential and all shifting mechanism. It's a brand new idea in fast, efficient materials handling.

For complete information, write Towmotor Corporation, Cleveland 10, Ohio, and ask for folder No. F-37.

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Today, by comparison, the plant is a sprawling giant measuring nearly 400,000 square feet of floor space. In addition, the Landis plant in Canada includes 10,900 square feet. During the last 6 years we have continued to grow—through building 40,000 square feet of additional facilities in Waynesboro—the purchase of Maiden and Company, Ltd. in England—and an immediate expansion of 17,000 square feet at Maiden.

But mere physical size is not the only indication of growth. There are other indications, perhaps less tangible, but just as important. Maturity is one. Sincerity is another. And maybe the most important of all is Responsibility.

Landis is proud that it has "grown-up" not only in ways that show in figures and statistics, but also in ways that show in a friendly smile, a sincere hand-shake, and the willingness to accept the responsibility for customer satisfaction. These non-statistics are just as important to the people at Landis as graphs and charts; and, for over 50 years, they've proved to be important to our friends and customers.

For assistance or information on any phase of threading production or equipment, call or write Landis—The World's Largest Manufacturer of Threading Equipment.

LANDIS *Machine* COMPANY
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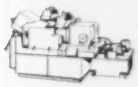
THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT

Thread Rolling Machines

Thread Rolling Tools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Taps – Collapsible & Solid Adjustable

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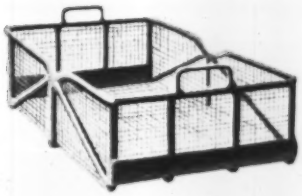
FOR THE METAL PART

THAT TAKES THE BEATING



HAYNES Alloys *will do the job!*

Three years' operation at temperatures ranging from 1450 deg. F. to 2040 deg. F.! That's the record of a tray made of HASTELLOY alloy X, used for holding parts in a heat-treating furnace during hardening, gas carburizing, or gas carbonitriding. After the heat-treating cycle, parts are plunged into an oil quench—still in the tough tray.

If you are looking for a metal for machinery parts that have to withstand heat, corrosion, wear—investigate HAYNES alloys. There are more than 15 to choose from, including HAYNES STELLITE cobalt-base alloys, HAYNES iron-base alloys, HAYSTELLITE cast tungsten carbide, and HASTELLOY nickel-base alloys. They are available as castings, forgings, completely fabricated parts, or as sheet and bar stock. All parts can be furnished machined or ground to specified size and finish.

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HAYNES STELLITE COMPANY

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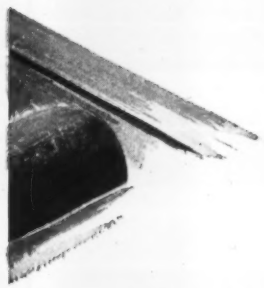
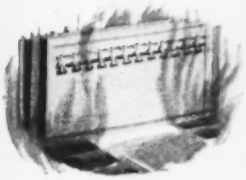
Address inquiries to Haynes Stellite Company, 420 Lexington Avenue, New York 17, N. Y.

The terms "Haynes," "Haynes Stellite," "Hastelloy," "Haystellite," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

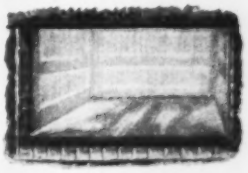
TYPICAL "HAYNES" ALLOY HEAT-RESISTANT PARTS



GRID TRAY of HASTELLOY alloy X holds bits during bonding of diamonds to drill bit face. Furnace heat is 2300 deg. F. in 1½-hour cycles. The trays withstand over 100 such cycles.



FURNACE DOOR HANGERS of HASTELLOY alloy X, exposed to 2000 deg. F. flames in either oxidizing or reducing atmospheres, have served over a year. Steel failed in three weeks.



HEARTH PLATES and hanger bolts of HASTELLOY alloy X are in their second year of service in electric furnaces that reach 1950 deg. F.—resisting oxidation, thermal shock, heavy loads.

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LARGE OR SMALL HEAT TREATED OR PLAIN

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gives you the most consistent performance you've ever had from stainless!

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Predictable performance! Only *Carpenter* stainless steels give you such positive assurance of fast, safe fabrication . . . free and easy machinability you can really count on. And not only will *Carpenter* stainless steels save you time and money in the shop . . . they will also enhance your product reputation in the field. For no matter what combination of properties your product demands in service, you can count on getting them again and again . . . with perfect uniformity. You get predictable performance all the way.

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Carpenter **steel**

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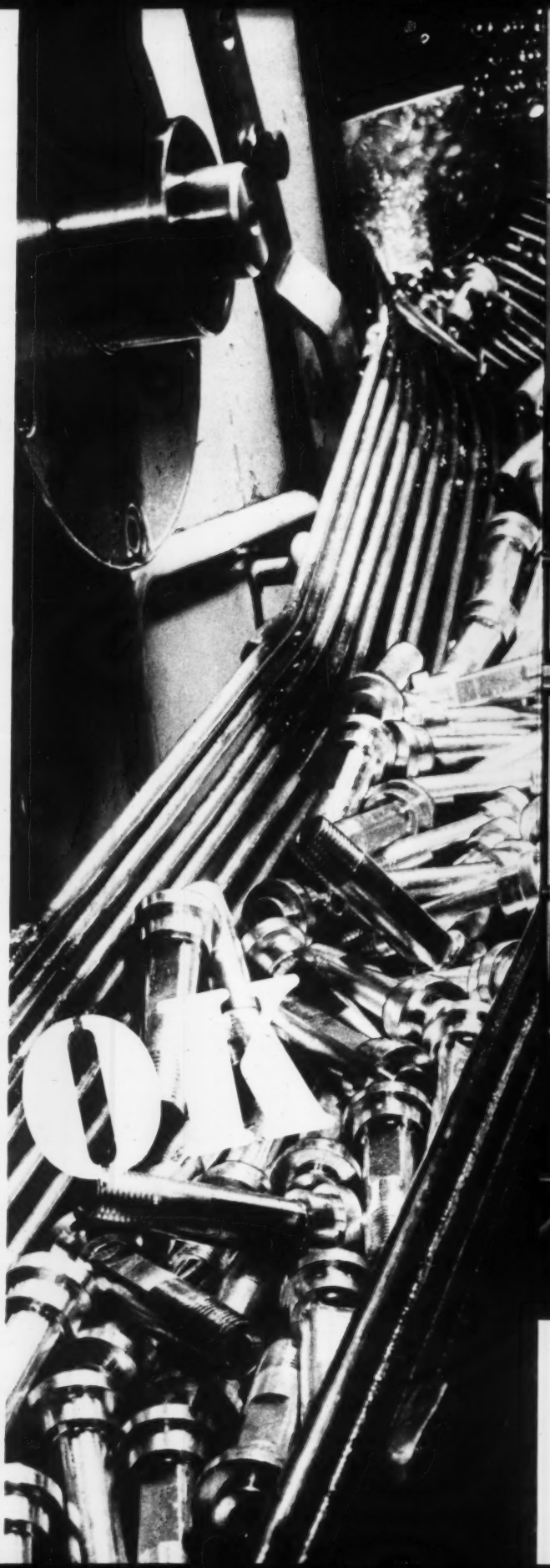
. . . don't you wish
you had that much faith
in the uniformity of the

stainless steel bar stock

you use?



$2H_2 + O_2 - 2H_2O$

You can always count on this chemical reaction. It's absolutely predictable...

local service from coast to coast!

stainless steels! tool and die steels! special-purpose alloy steels!

Check your nearby Carpenter SERVICE-CENTER *first:*

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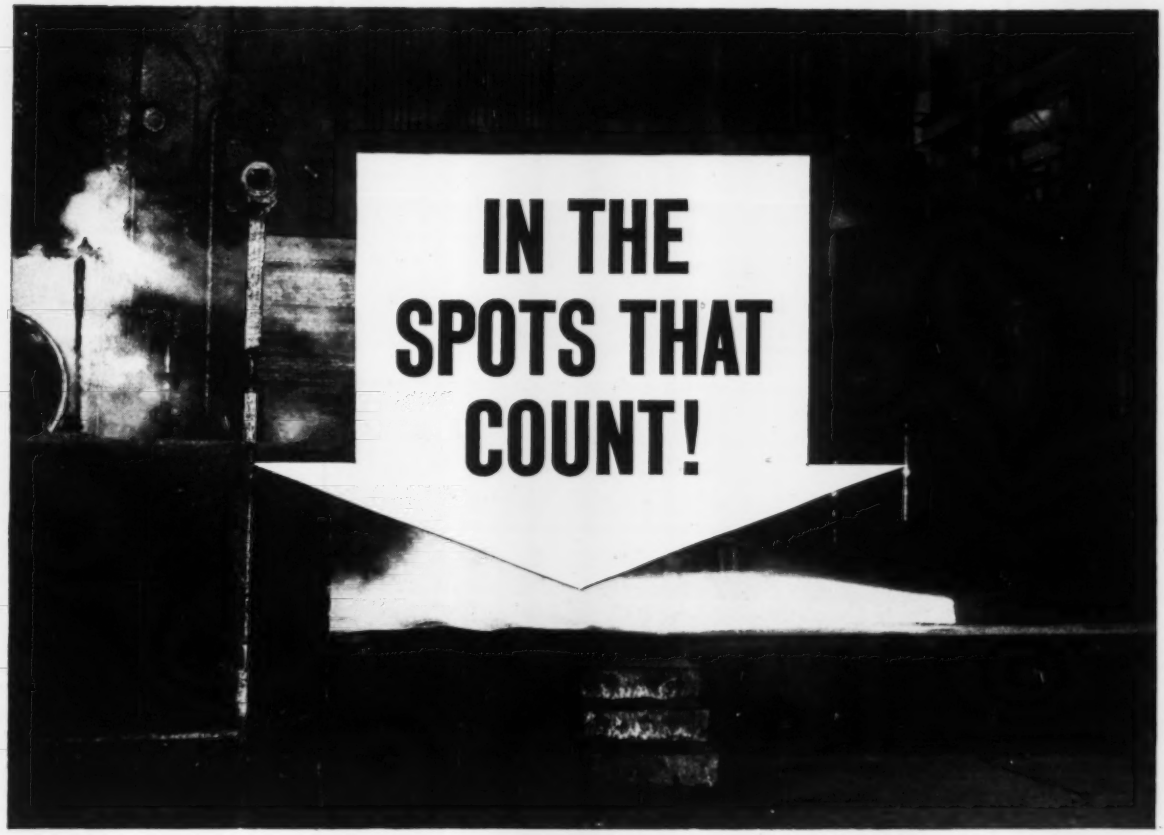
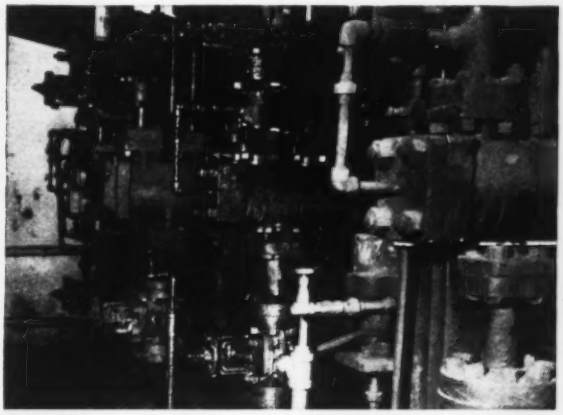


split-second control with Homestead® Operating Valves keeps steel plate rolling!



Solenoid-hydraulic pilot controlled 4" and 2½" Hydro-Cushion Homestead Operating Valves; and Lever-Seald Hydraulic Stop Valves; 800 pounds working pressure.

Six days a week, twenty-four hours a day, 250 times an hour, the tilt tables and middle roll of an East Coast Plate Mill are exactly positioned without shock, and held without creepage, by Homestead Operating Valves. This precision control has permitted record-breaking rolling of the hot steel slabs into plate.

Through more than *three and one-half million* split-second rollings during the two years the 2½" and 4" Hydro-Cushion Homestead Operating Valves have been in service, not one shutdown has been required for valve maintenance! Performance records such as these, are assured by the protected seat and cushioning action of the Homestead Valves.

For any hydraulic control problem, there is a Homestead Operating Valve to meet your needs. Send today for Reference Book 39-6.

Please send Reference Book 39-6 and prices on all types of Homestead Operating Valves. 98

Name.....Title.....

Company.....

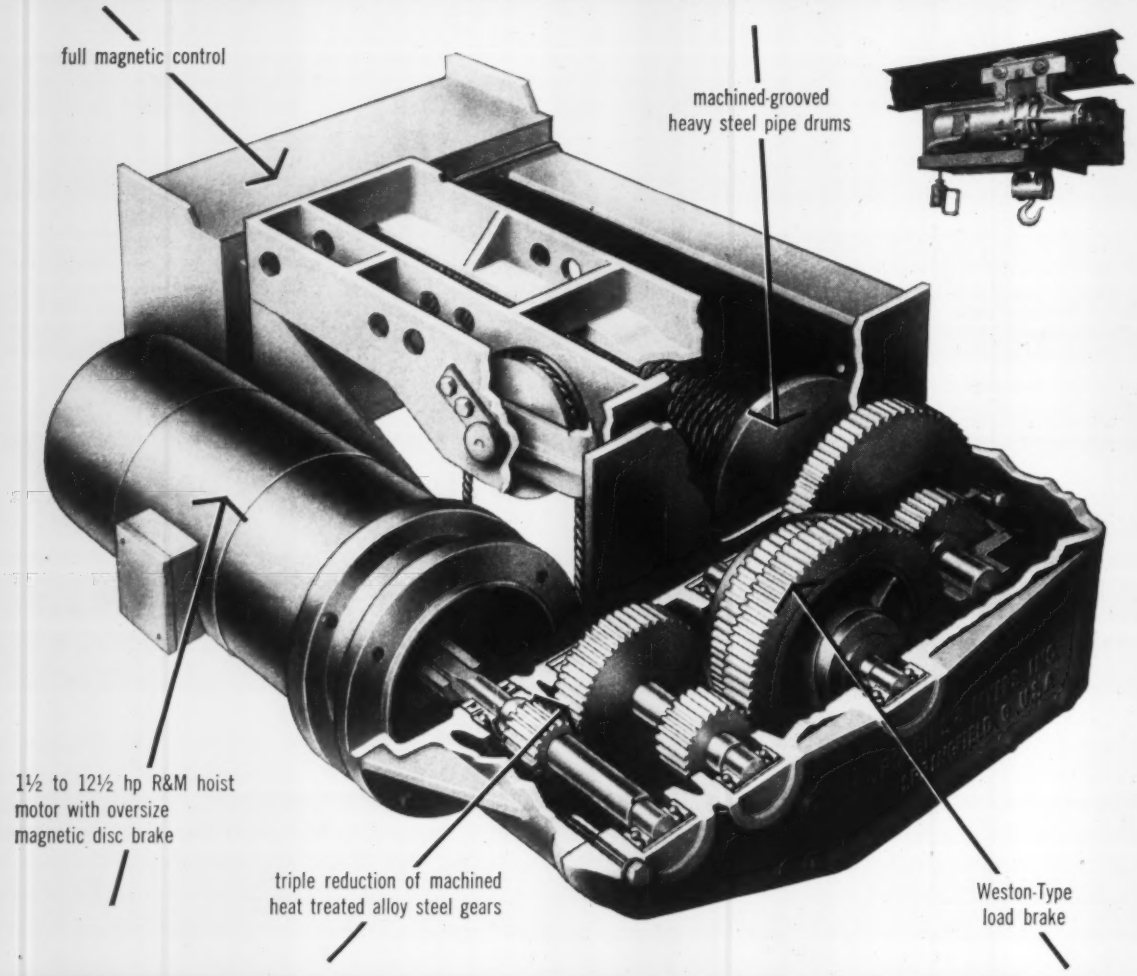
Address.....

City.....Zone....State.....

hv

HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. Box 98 Coraopolis, Pennsylvania

big hoist value



R&M Type F standard low-headroom hoists excel in the heaviest, most severe service. Frame is solidly braced welded steel. Special weather and dustproof R&M hoist motor runs cool, has the highest time rating found in any standard hoist—30 min., 55° C. rise. And the oversize magnetic disc type motor brake requires virtually no adjustment. Full magnetic control with reduced push-button voltage is standard. With lug mounting, Type F-2 headroom is only 16½" in 2 ton capacity.

Capacities: ½ to 10 tons. Speeds: 10 to 54 fpm. Lug mounting; push, hand geared or motorized trolleys.

Robbins & Myers, Inc., Hoist & Crane Div., Springfield, O.

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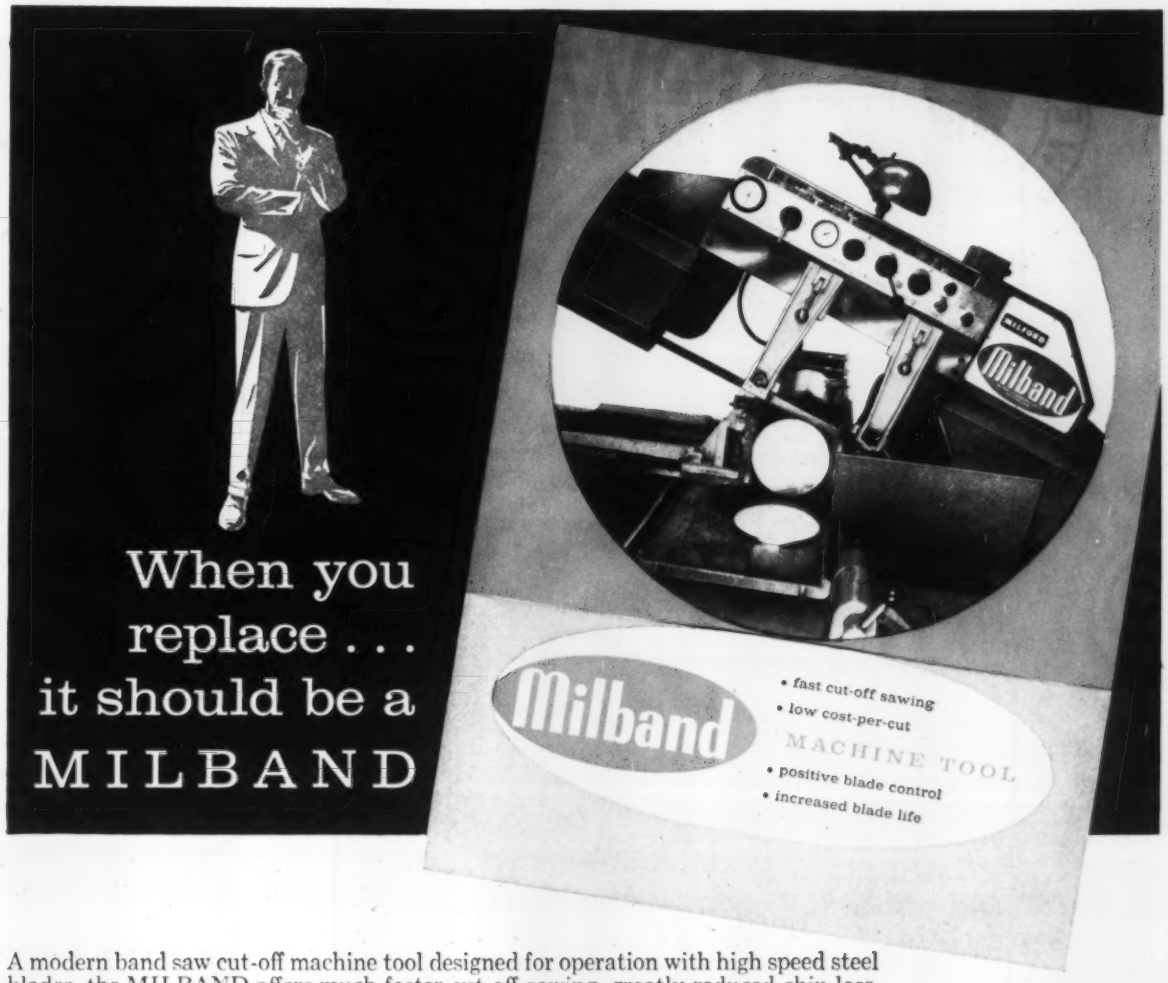
Request Bulletin 801-C today


When you replace . . . it should be a MILBAND
Milband
• fast cut-off sawing
• low cost-per-cut
MACHINE TOOL
• positive blade control
• increased blade life

A modern band saw cut-off machine tool designed for operation with high speed steel blades, the MILBAND offers much faster cut-off sawing, greatly reduced chip loss, and cuts consistently smoother, straighter and more accurately. *Your* next investment in cut-off equipment *should* be a MILBAND!

The circular featured above covers all the important facts about the many advantages offered by continuous-action band sawing. It also covers all the design and construction features that make the MILBAND Machine Tool today's (AND tomorrow's) wisest investment in a cut-off machine. Use the coupon below to send for your free copy, and check the facts for yourself. If you want additional dollars-and-cents proof, we'll be glad to run actual tests on a MILBAND Band Saw Machine Tool and submit a complete time-and-cost analysis report.

MILBAND MACHINE TOOL DIVISION

THE HENRY G. THOMPSON & SON CO. NEW HAVEN 5, CONNECTICUT

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☐ Please send my free copy of the MILFORD circular giving complete information on the modern, band saw cut-off method with the MILBAND Band Saw Machine Tool.

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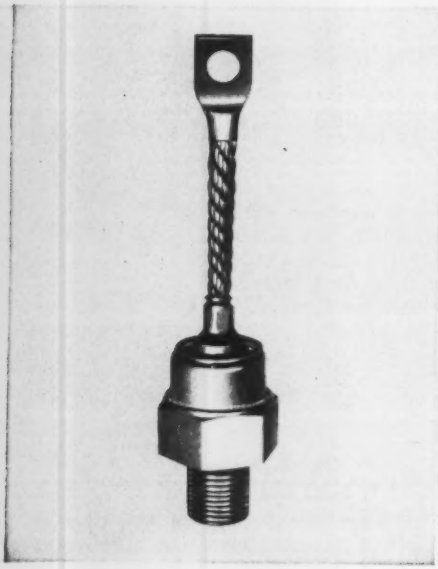
new . . . Silicon Type WS

200, 300, 400 and 500 Amperes
230/460 Volts
60% Duty Cycle



Silicon diodes in the three-phase, full-wave rectifier are the heart of the WS welder. These diodes have a capacity far in excess of the rating for the welder and are hermetically sealed against dust, oil, water and acid fumes by a new bonding process. Each diode is thoroughly tested before and after insertion in the bridge.

Watch Westinghouse for New Developments in Welding

Rectifier Welder

- *Maximum Performance at Minimum Cost*
- *Highest Degree of Electrical Efficiency*
- *Most Compact Welder in the Industry*
- *Extremely Low Maintenance*

The Type *WS* silicon rectifier welder reflects engineering skill of the highest order. This welder is designed for maximum performance and reliability. It is a product of experience–developed in the Westinghouse laboratories and tested in the field under a variety of conditions. The welder you purchase will be checked out in every detail before it leaves our factory. Every conceivable precaution has been taken to assure you of a faultless piece of equipment.

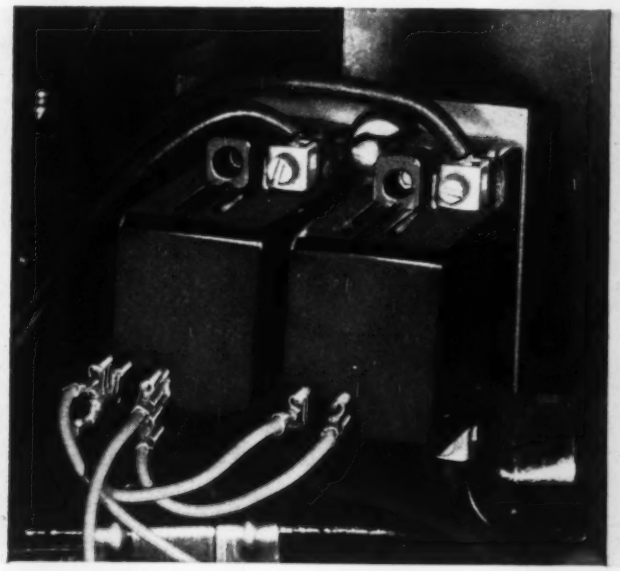
Westinghouse pioneered this completely new concept in industrial welding machines over 10 years ago. Since that time another refinement of the rectifier-type welder was achieved by Westinghouse through the use of silicon diodes. The ultimate in silicon rectifier machines is the Westinghouse Type *WS*.

No other welder on the market has the electrical circuitry to produce sound quality welds as consistently as the *WS*. It provides easier starting, arc stability and maximum drive. Silicon rectification means top welding performance.

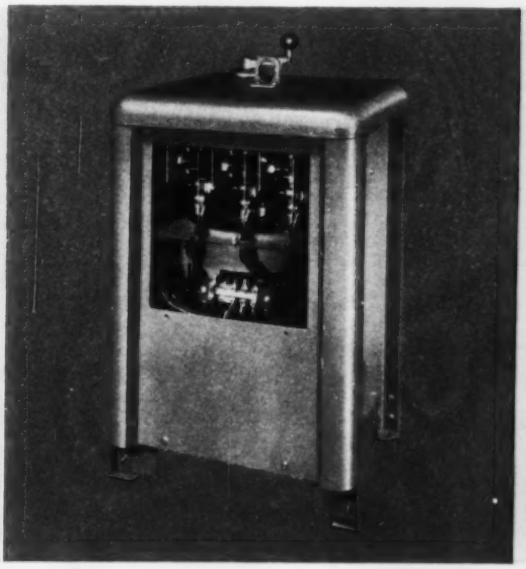
The *WS* is the lightest, smallest machine on the market. It is easy to handle and is a space saver. Its bonderized steel casing, protected by baked-on enamel, gives it a weatherproof construction. The high-quality materials in this welder will render long life and trouble-free service.

Learn more about this reliable source of power for welding!

Contact your nearest franchised Westinghouse welding distributor–or write: Welding Division, Westinghouse Electric Corporation, 4454 Genesee Street, Buffalo 5, New York. J-22150



The inverse time relay shown here allows adequate time delay for arc starting at high current setting and freedom from nuisance power interruptions—yet it protects against serious short circuit faults. Capacitors divert and store peak, high-value, short-time voltage spikes that occur when electrical current is broken.



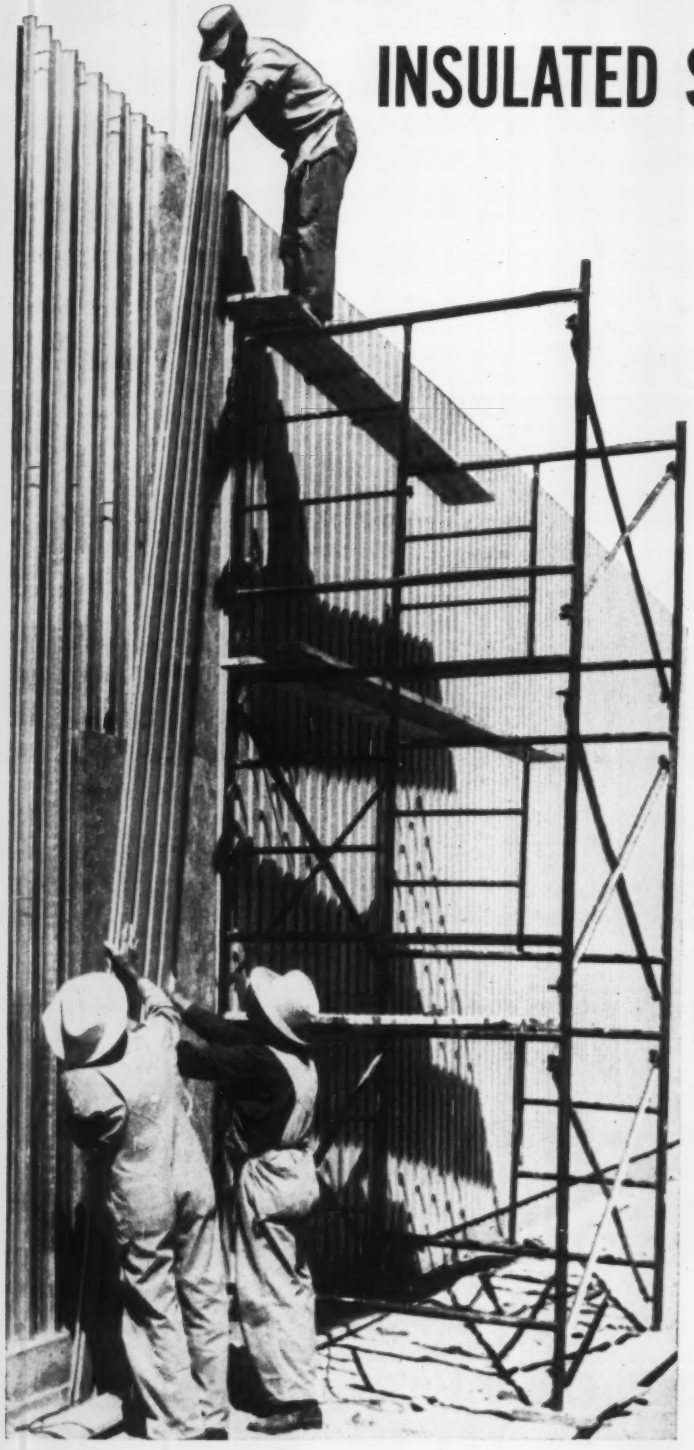
The Type WS has virtually no moving parts to wear out; thus, replacement is at a minimum. The easy access panel shown here makes routine maintenance and air cleaning of the rectifier bridge a fast, simple operation. Be cost-wise, avail yourself of this extremely low maintenance!

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

TRUSCON

INSULATED SIDEWALL PANELS GO UP EASY... GO UP FAST...



Truscon Insulated Steel Sidewall Panels combine versatility in design and construction for lowest installation and maintenance costs. Easy to apply, economical, architecturally beautiful. Available for immediate delivery.

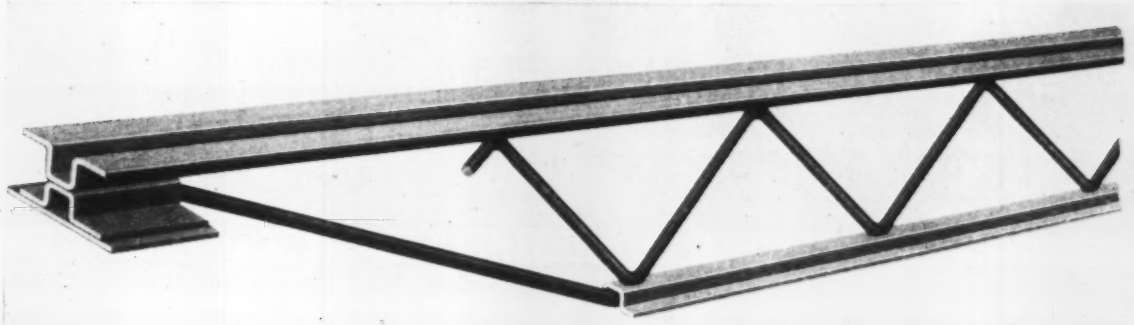
Truscon Panels are constructed by sandwiching a layer of insulating material between two sheets of Truscon 24″ FERROBORD® or galvanized ribbed sheeting. Panels are securely interlocked and button punched for maximum weather-tightness.

Results: An exceptionally low-cost insulated wall completely fabricated during erection in the field. Panels are furnished, painted, or galvanized, in widths of 2′-0″, and up to 40′-0″ in length. Painted or galvanized exterior and interior require very little maintenance.

The long lengths available in Truscon facing panels and the absence of horizontal joints assure savings in erection time, and a neat, trim surface. Interlocking side joints blend with the fluted design of the panel and provide a pleasing, classic appearance.

To learn more about Truscon Insulated Sidewall Panels call your Republic-Truscon representative. Or, write direct.

KNOP Television Station, North Platte, Nebraska
North Platte Television, Inc.
Architects: Hinde & Laurinat



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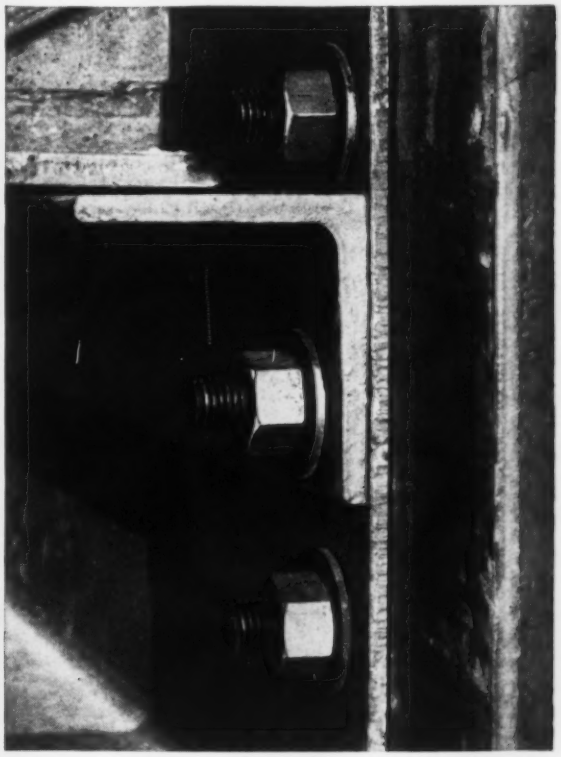
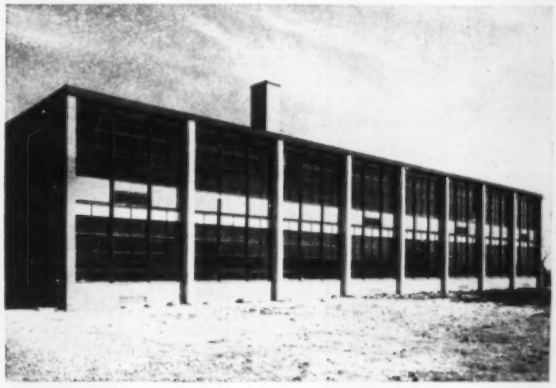
REPUBLIC HIGH STRENGTH BOLTS provide strong, safe connections. High clamping force transfers loads to structural members by friction alone — an advantage that only high strength bolting provides. Installation easy, quick, economical. Write today.

TRUSCON VISION-VENT WINDOW WALL construction added to the beauty, lowered the cost of the Trenton School, Cincinnati, Ohio. Erection is fast because VISION-VENT is a wall with the window already in place. Architect: Joseph Stith. Send coupon below.





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HANDY & HARMAN SILVER BRAZING
Permits Manufacturer to Guarantee Underwater Air Regulator For Life

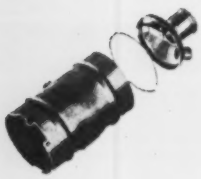
Perhaps the most vital component of a skin diver's equipment, this Viking Air Regulator, manufactured by Christensen Tool & Engineering Company, Norwalk, Connecticut, is structurally guaranteed for life. It must, under all conditions, be absolutely leaktight. The manufacturer's guarantee is a relatively recent achievement—through the high-strength help of silver alloy brazing with Handy & Harman EASY-FLO 45 and HANDY FLUX.

Over and above the unreserved dependability of brazed joints, the brazing method itself has saved the company considerable time, money and material in the production of the Viking Air Regulator. Brazing's simplicity is interestingly illustrated in this case by this company's requirement that assemblers and testers of the Viking must be skin divers themselves.

Almost invariably, silver brazing effects economies and brings advantages to whatever part, product or assembly it is applied. True, air regulators are few and far between, but the point is that they are *metal products, made of a number of different metal components.*

And that's the phrase that covers brazing's great adaptability. To give you a good idea of how you can put brazing to work, we'd like to send you Bulletin 20—it covers the basics of brazing and it may very easily solve your metal-joining problems. Handy & Harman, 82 Fulton Street, New York 38, N. Y.

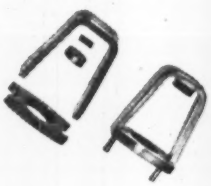
Here, in "serial" form is how the guarantee is "brazed" into the Viking:



1. TANK HOUSING—Initially, this component was mechanically joined and made "airtight" by means of sealants. Now, brazing eliminates 8 holes, 4 tapping operations, 4 screws and 3 assembly operations.

2. FORK ASSEMBLY—There are five separate brazed joints, done with hand torch and hand-fed wire. Brazing eliminates one tapped hole, a lock washer and a spacer, plus the fact that positive alignment is now guaranteed.

5. Shown here are the finished Viking components before and after assembling. —Brazing by Specialty Brazing Laboratories, Riverside, Connecticut.



3. YOKE—This is assembled from stampings instead of castings, which were previously used. With brazing, no secondary finishing operations are required. Further, the part is stronger and lighter, and savings on material and labor on this component alone add up to 28%.

4. PISTON—This is the most important single element of the Viking. It regulates flow of oxygen from cylinder to mouthpiece; from 300 lbs. pressure to normal breathing. Without brazing, this part could not be made.

Your No. 1 Source of Supply and Authority on Brazing Alloys

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General Offices: 82 Fulton St., New York 38, N. Y.

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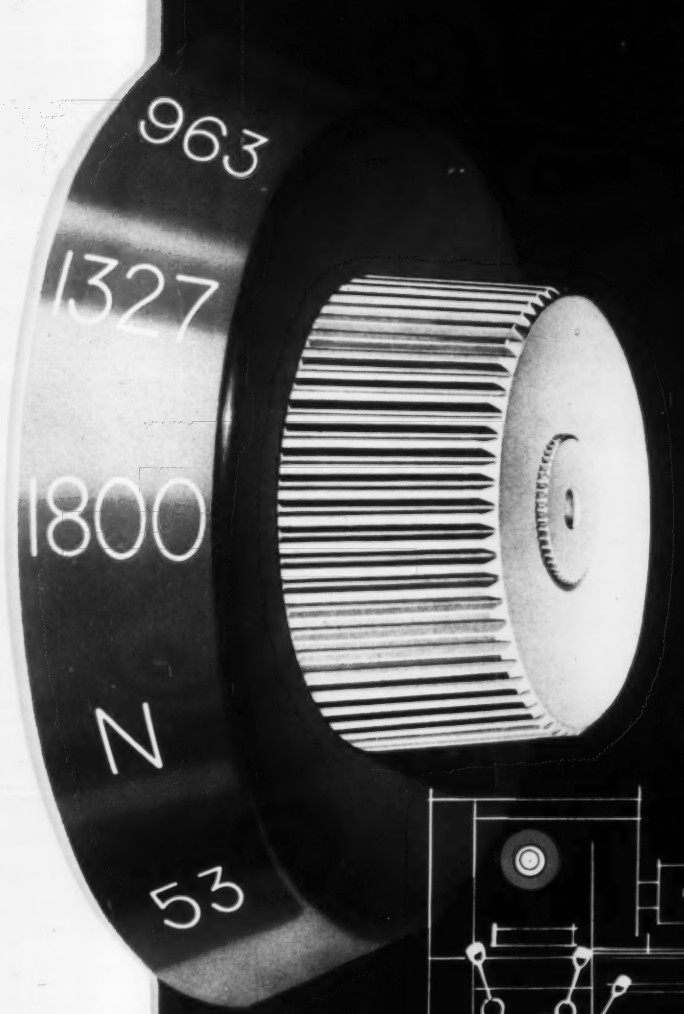
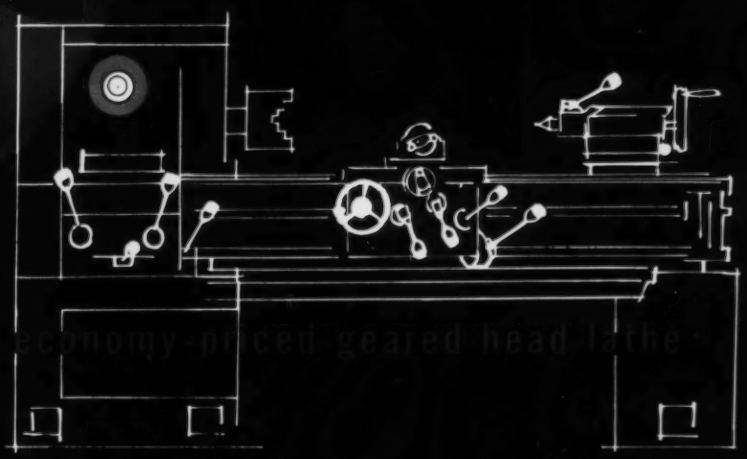
COMING IN NOVEMBER! *New Handy & Harman Brazing Correspondence Course. Simple self-study data on all phases of brazing.* ***Send*** *for details to Dept. BC.*



new

from cincinnati
lathe and tool....



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with power dial speed shifting

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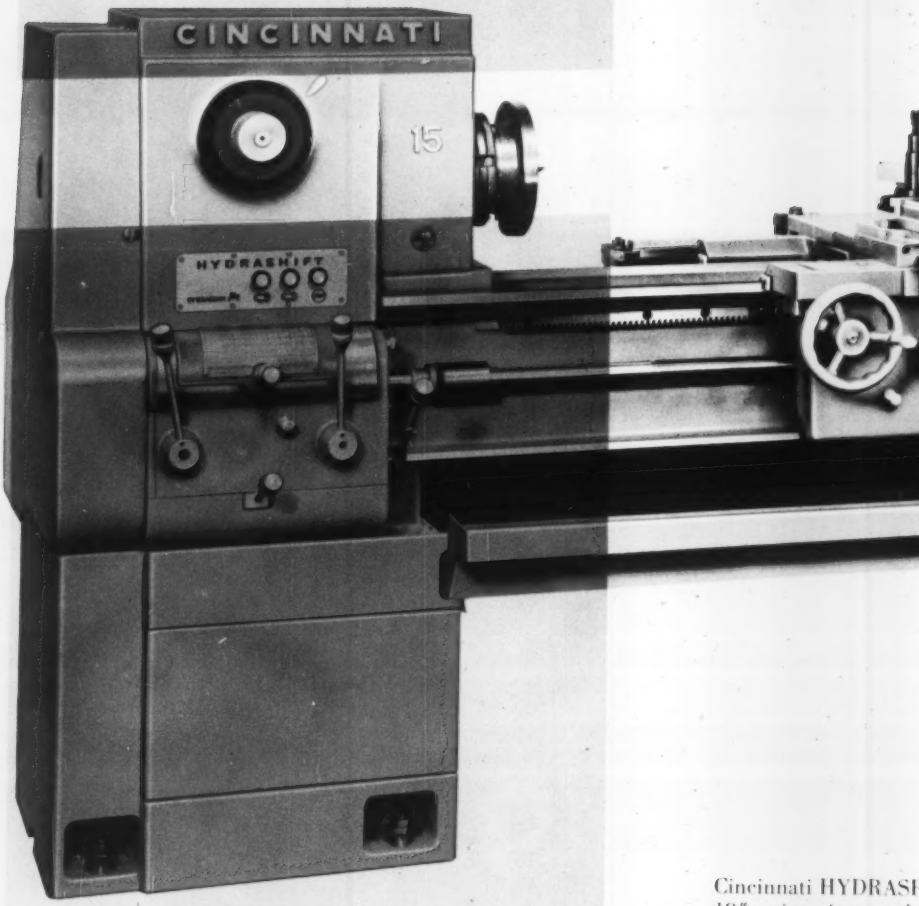

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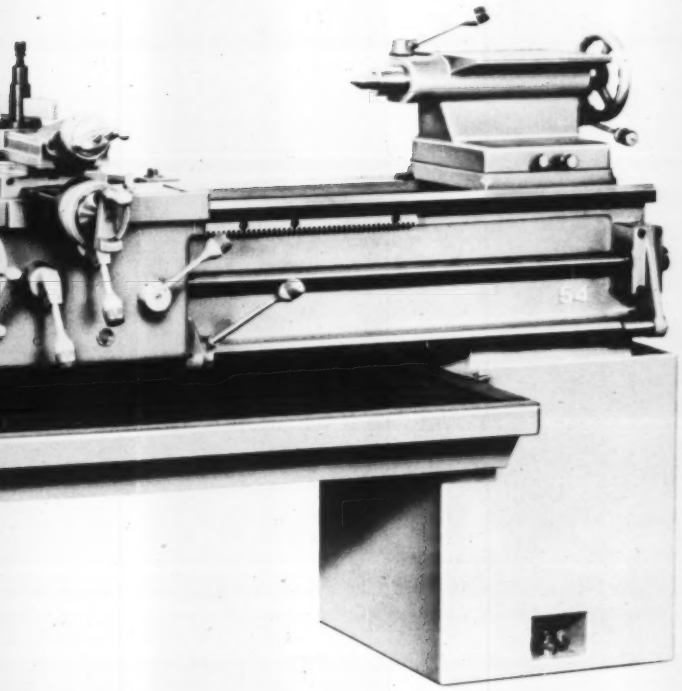

These CINCINNATI LATHES are NEW—from headstock to tailstock! They are designed to provide more time for cutting and to reduce operator fatigue to a minimum. Yet, with their many new operating features, they are still economy priced.

new High Speeds with All-Geared Headstock—husky, Hydrashift gearing provides 12 speeds in geometric progression up to 3000 RPM.

new Compound and Cross Slide—wider, heavier bridge, compound and cross slide for heavy, high-speed cuts; large, easy-reading dials for new accuracies with greater operator speed and convenience.

new Quick-Clamping Tailstock—Cincinnati's unique tailstock design is even more versatile for fast tailstock positioning.

plus **new** greater horsepower . . . NEW husky beds with "Hardclad" flame-hardened ways . . . NEW coded push-button controls . . . NEW chip pan (slides in and out for convenient cleaning) . . . Totally enclosed quick-change feed box with 48 threads and feeds . . . and many other exclusive features on the NEW CINCINNATI HYDRASHIFT LATHES.

ASHIFT Lathes are built in 10″, 12½″, 15″ and
nd a wide variety of bed lengths. 15″ and 18″
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CIMPLUS, transparent, rust-preventing cutting fluid of the famous Cimcool family, scores sensationally at another busy shop.*
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SALES REPORT
2
plant makes woodworking machinery. Their 7 grinding machines, running 8 hours a day, were using a soluble oil coolant at the rate of 24 gallons a week. They changed to Cimplus and now they get by fine on only 10 gallons of Cimplus a week. They're saving about $80 a week!
They report they have no rancidity and no rust problems now. They like the transparency of Cimplus, too. The operators can see what they're doing.
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Chicago Office
*Firm name available on request.

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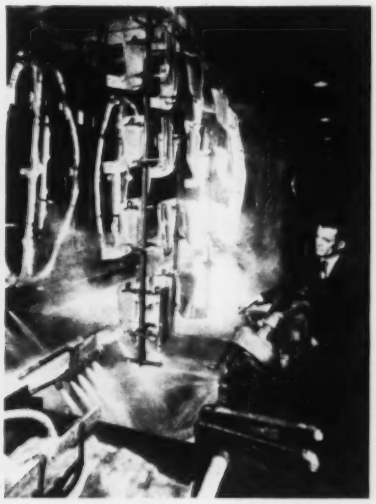
and/or sub-assembling the finished parts . . .

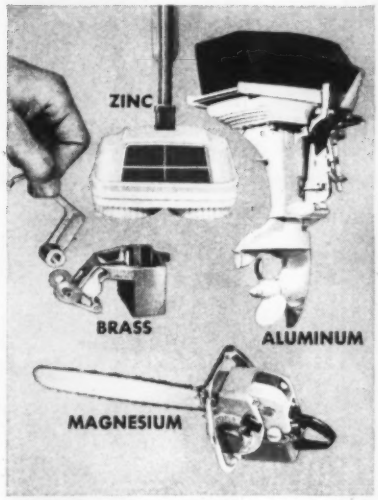
Never has as satisfactory

As the pictures above imply . . . Doehler-Jarvis makes the buying of die castings a simple matter today.

First, you deal with a Doehler-Jarvis Resident Engineer. Through him you can tap the full production and engineering talent of the most experienced company in die casting . . . no matter how large or small your requirements. Through him you obtain personal day to day liaison that insures maximum production economy through personal attention to your needs and problems.



You get immediate help in engineering the design . . . and evaluating the economics of die casting . . . plating or otherwise finishing . . .



using the most appropriate die casting alloys.

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assure economical production, reliable delivery.

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Second, in addition to the castings themselves, Doehler-Jarvis provides added resources you may need: ample alloy stocks; fully equipped die making shops; complete facilities for light metal working, including machining, finishing and sub-assembly lines; spacious die and parts storage; a huge tractor-trailer fleet to *assure* delivery.

Thirdly, you can be sure that Doehler-Jarvis has in its eight plants, the productive capacity to meet your schedules no matter how large . . . and a flexible organization to give them proper attention no matter how small.

Small wonder that many companies, large and small, look upon Doehler-Jarvis almost as a department of their own plant. That's true of makers of hand power tools, of floor waxers, of sprinklers and garden hose fittings, of chain saws, of typewriters, of kitchen and other appliances, of hundreds of other products.

Doehler-Jarvis has served many companies for more than a quarter century, some for better than 50 years. Proof enough that no other die caster provides more quality, more service and more overall economy to the customer. Ask your Doehler-Jarvis Resident Engineer to tell you how much we are prepared to do to establish equally satisfactory supplier-purchaser relations with you.

Doehler-Jarvis

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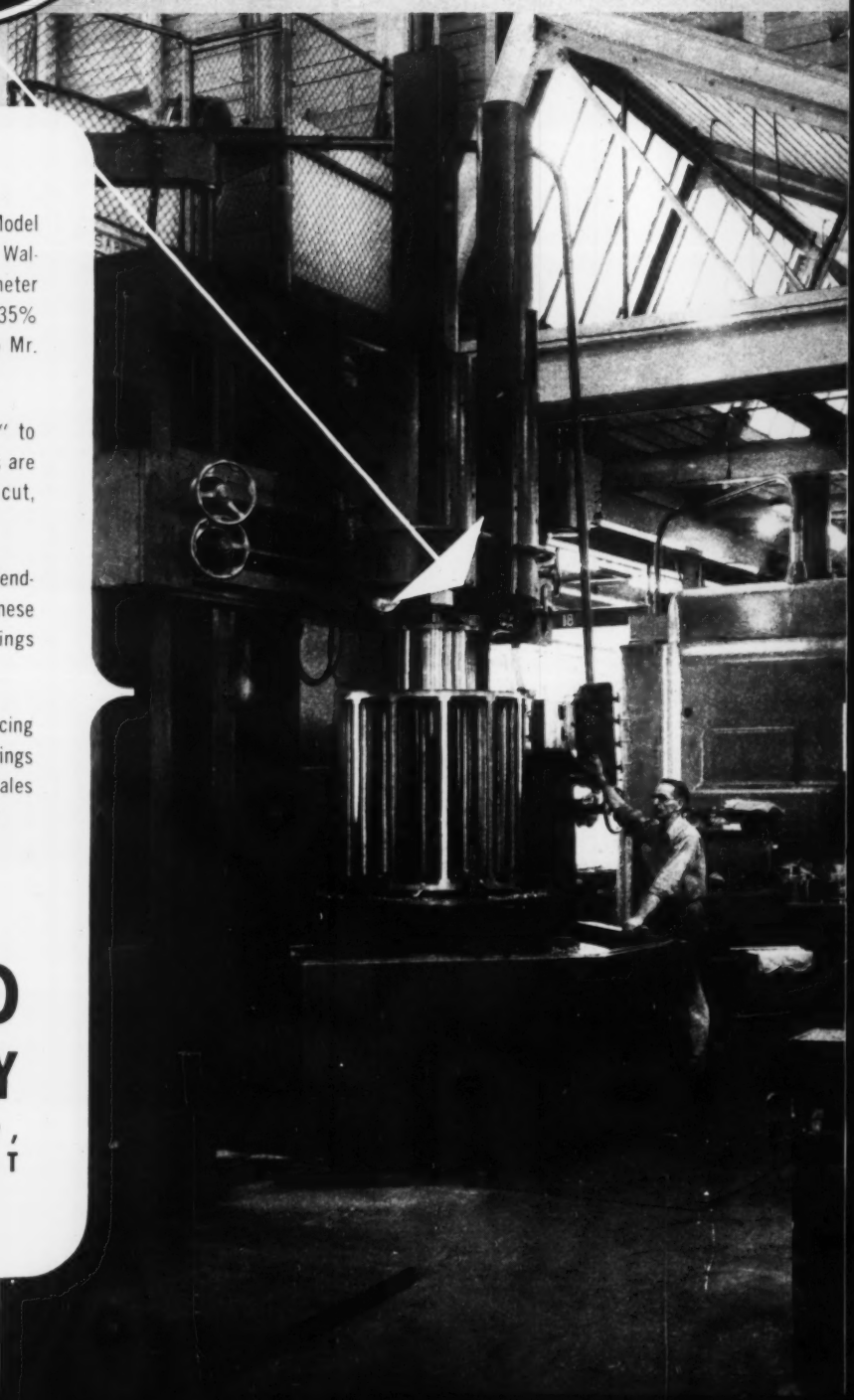
35% Faster with a BULLARD CUT MASTER Model 75



With their new 76" Bullard Cut Master, Model 75, the Bird Machine Company, South Walpole, Mass., is machining a 39-5/8" diameter stainless steel cylinder frame assembly 35% faster than previously, according to Mr. James Lindsay, General Superintendent.

For the rough cut, removing from 1/8" to 3/16" of stock, the ram and side heads are cutting simultaneously. On the finish cut, .005" deep, only the side head is used.

Accuracy to hold size reduces spoilage. Pendant control reduces operator fatigue. These factors contribute to make these savings possible.

An analysis of your turning, boring, facing and threading operations may show a savings over your present method. Your Bullard Sales Engineer can tell you. Why not ask him?

Or, write

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Eagle Music Wire

—for Dependable Springs—

Our Phosphate Coated Music Wire

. . . especially merits your careful investigation if you are interested in superior uniformity of PHYSICALS. This wire amazes the Spring Manufacturer when he tries it on his most difficult jobs. *A trial order will convince you.*

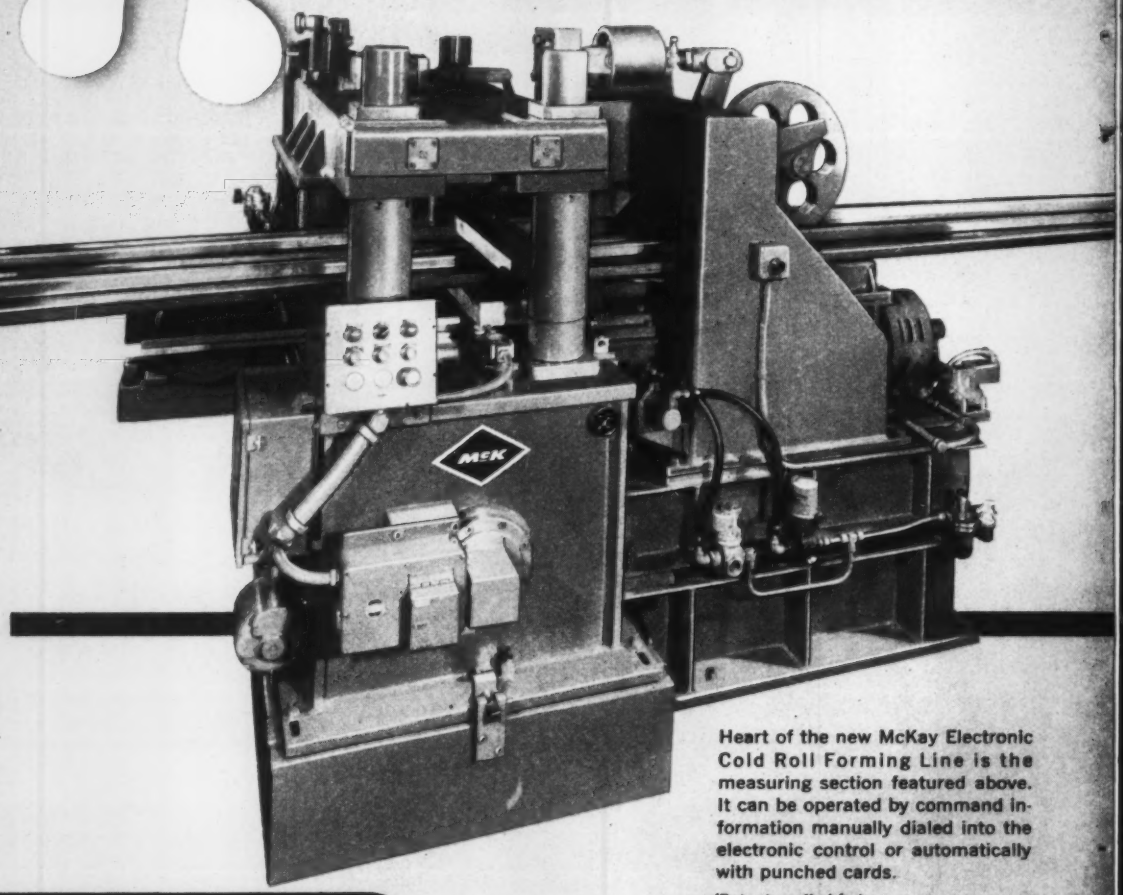
WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

109

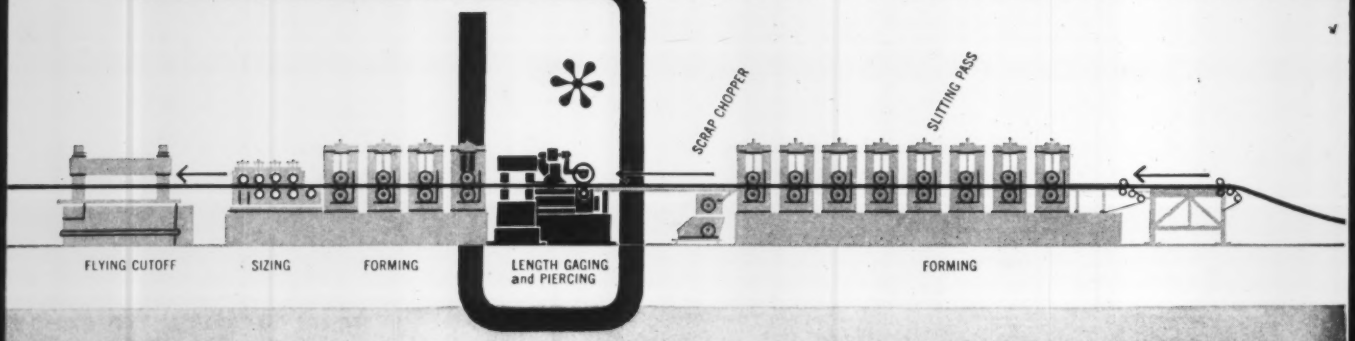
CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

10,001



Heart of the new McKay Electronic Cold Roll Forming Line is the measuring section featured above. It can be operated by command information manually dialed into the electronic control or automatically with punched cards.

(Patent applied for)



The line illustrated above was recently purchased by a large building products manufacturer for high speed production of roof and floor deck.

different lengths...

...WITHOUT A MANUAL ADJUSTMENT

McKAY'S ELECTRONIC LENGTH GAGE has a memory permitting instantaneous changes in cut lengths and scheduled quantities as well as precise control of notch and punch spacing on each length.

A transistorized electronic control reads and stores information from punched cards and utilizes an electronic counter to trigger a punching and notching press at precise intervals as commanded by the coded data on the punched cards.

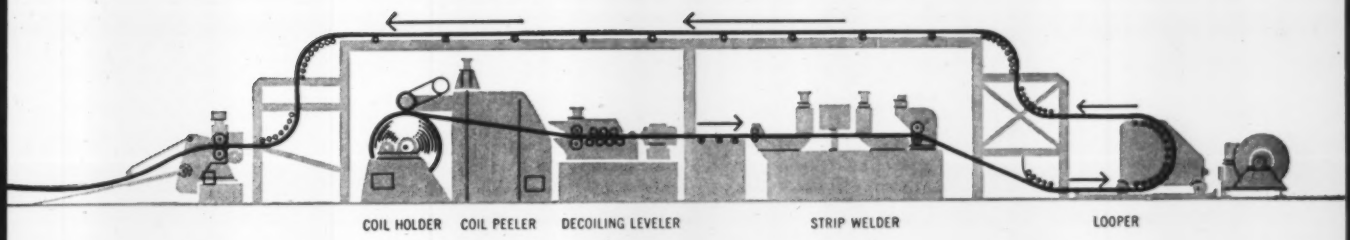
Now! the planning department can schedule the output of a forming or cut-up line without waiting to group identical lengths.

Now! down time previously required for manual length gage adjustment is converted to productive time.

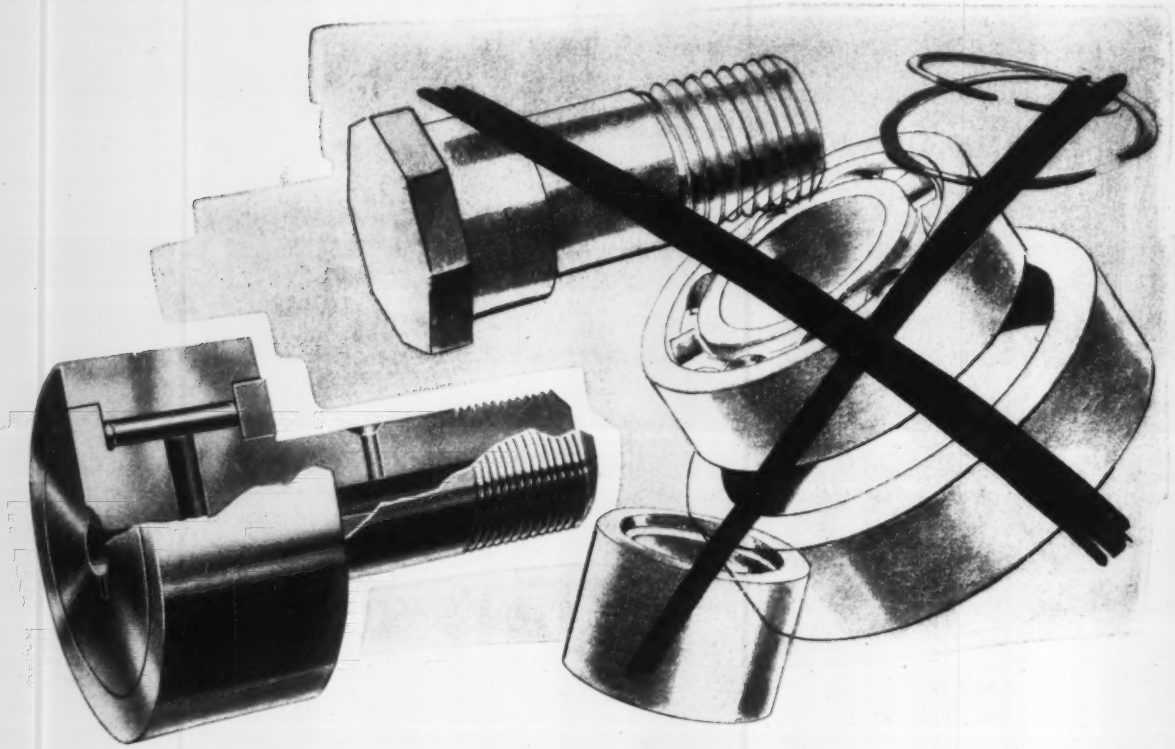
Now! in addition to length control, precise spacing of notches and punches can be controlled and changed by commands received from coded information on the standard data processing card.

BE SURE TO GET THE FULL STORY ON McKAY'S ELECTRONIC GAGE FOR YOUR PRODUCTION LINES.

Call or write the McKay Machine Company, Youngstown 10, Ohio.



McKAY McK MACHINE



McGILL® CF *CAMROL*® bearings

eliminate the cost of producing and assembling improvised cam follower, track and guide roller units

THESE CAMROL ADVANTAGES SOLVE COST, DESIGN, PRODUCTION AND PERFORMANCE PROBLEMS:

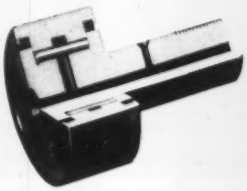
• AVAILABILITY • INTEGRAL UNIT CONSTRUCTION • HIGH LOAD CAPACITY • SMALL RADIAL SPACE REQUIREMENTS • HIGH SHOCK RESISTANCE • PRECISION ACCURACY • SIMPLIFIED LUBRICATION

You can simplify design and cut cost with CAMROL, precision cam followers. Procurement, production and assembly of components for improvised units are eliminated when you specify CAMROL bearings that are available from stock.

McGill developed the original roller bearing cam follower and perfected the CAMROL design through 25 years of application experience. Its full type construction provides exceptionally high capacity in an integral unit of a flanged, specially heat treated stud and heavy shock resistant outer race. Grease lubrication is simplified. Plain bearings require constant oil lubrication and bolt mounted ball bearings races crack under equivalent loads.

Precision construction, including concentricity of stud to outer race OD, provides accurate alignment of machine members. Ease of interchangeability and dependable operation in any cam action, track, guide or support roller application is assured. Use the CYR series in the same roller diameters for shaft mounting.

PRE-LUBRICATED SEALED CAMROL BEARINGS



These bearings combine the advantages of CF and CYR series bearings plus effective sealing against dirt, dust and grit. Ideal in applications where lubrication is a problem. Black ferrous oxide finish resists corrosion in contaminated areas.

CAMROL bearings are available in standard roller diameters from ½" to 4". Capacities to 20480 lbs. at 100 RPM.

WRITE FOR FREE CATALOG NO. 52-A

engineered electrical products

McGILL®

precision needle roller bearings

McGILL MANUFACTURING COMPANY, INC., BEARING DIV., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

... Results of a Superior Beginning

The countless parts and products made from Roebling high-carbon steel spring wire and flat spring steel have one thing in common . . . their superior quality. This, of course, is related to the inherent fineness of the materials.

The variety in which Roebling offers these spring materials is equally impressive. They are available in hard drawn, hard rolled, annealed or soft, tempered or untempered. Types include zigzag and no-sag wires; upholstery and mechanical spring wires; valve spring wire; clock- and motor-type spring steels and flat spring steels of all types and description.

Whatever the type, size or characteristics you require—Roebling can fit your needs exactly. You'll find that Roebling quality means maximum production from your machines and consistent uniformity in your product.

For spring wire and flat spring steel information, contact Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

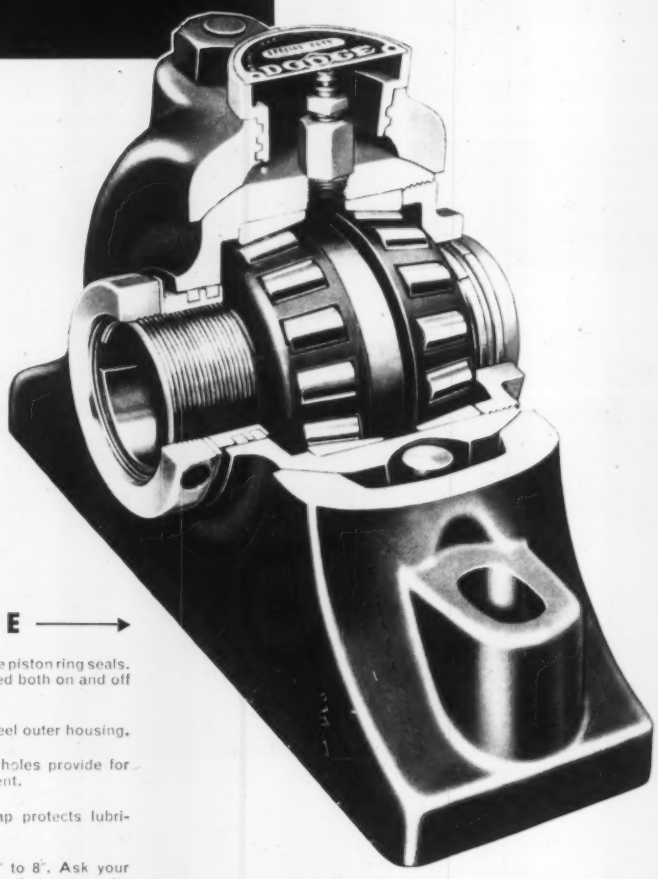
ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

DODGE PILLOW BLOCKS WITH TIMKEN BEARINGS

America's super-quality line—with a 35 year record of keeping performance *up* and costs *down!* Five types—to fit practically any service condition. All assembled, adjusted, lubricated and *sealed* at the factory for precision performance—long life—dependability.



SPECIAL DUTY TYPE →

- Designed for extreme precision and high load capacities.
- Fully self-aligning.
- Special Duplex Timken Roller Bearing with tapered bore.
- Split tapered sleeve with straight cylindrical bore extends through entire length of housing.
- Easy to mount or demount. Adapter nut (or collar) clamps adapter sleeve to shaft with extreme firmness.
- Automotive type piston ring seals. Bearing is sealed both on and off the shaft.
- Rugged semisteel outer housing.
- Elongated bolt holes provide for lateral adjustment.
- Special dust cap protects lubrication fitting.
- Shaft sizes 1¼" to 8". Ask your local Dodge Distributor—or write us for Bulletin A670 giving complete technical data on America's most complete line of mounted bearings.

DODGE MANUFACTURING CORPORATION, 4400 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE
of Mishawaka, Ind.

Bring yourself up to date with this new trichlor booklet

Here is a new brochure on trichlorethylene. It covers every area from material specification to process setup and control to handling and storage and safety procedures.

All told, there are thirty-six pages of authoritative facts and recommendations.

Basic degreasing cycles are covered. Vapor. Warm liquid, vapor. Vapor, spray, vapor. Boiling liquid, warm liquid, vapor. Each is illustrated in color to show basic equipment and process flow.

You'll find a wealth of fundamental data on trichlor as a chemical and process material, including sections on such subjects as the recovery of used solvent and what sorts of materials to use in handling and storage.

There is also a discussion of the new grade of NIALK® Trichlorethylene which you can use for both vapor degreasing for flushing, and for cleaning rocket and missile components.

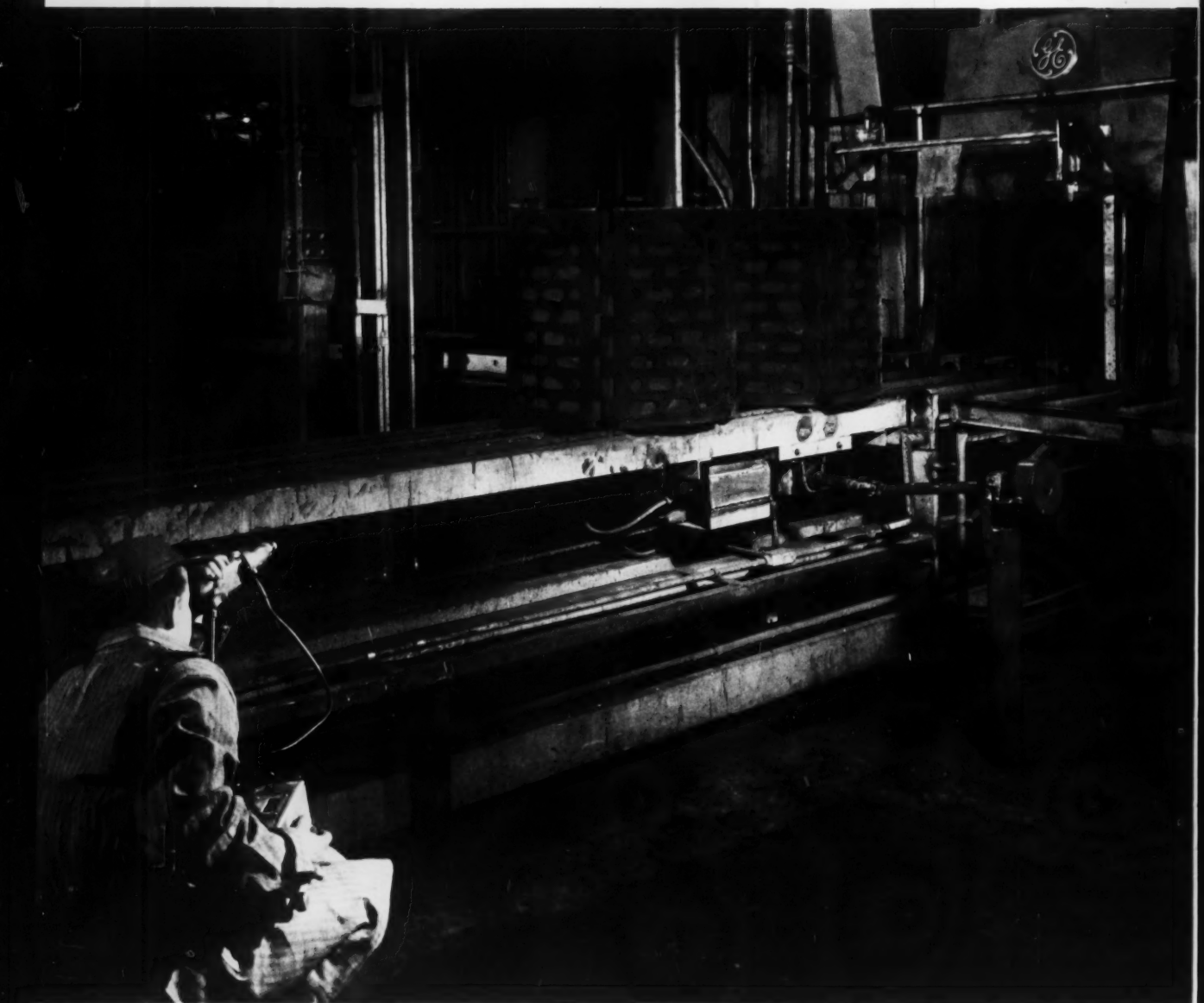
The full title is "Nialk Trichlorethylene for Vapor Degreasing and Other Uses." You can get a copy by simply asking for Bulletin 44-A.

HOOKER CHEMICAL CORPORATION
1211 Union Street, Niagara Falls, New York
Sales Offices: Buffalo Chicago Detroit Los Angeles New York
Niagara Falls Philadelphia Tacoma Worcester, Massachusetts
In Canada: Hooker Chemicals Limited, North Vancouver, British Columbia

HOOKER CHEMICALS PLASTICS

From General Electric . . .

HEAT



Castings automatically transferring from high temperature furnace to other pearlitic annealing equipment at Marion Malleable Iron Works, Marion, Indiana.

GENERAL ELECTRIC

ONE FURNACE SYSTEM DOES SEVEN JOBS

General Electric "systems" design combines furnace, temperature and atmosphere controls, and materials handling to cut annealing cycle 75%, provide added flexibility, and lower processing costs

When you bring your heat processing problems to General Electric, our engineers will give you what you want and need. Whether it's gas or electric, a small batch furnace or a complex, automated system, you need go no further.

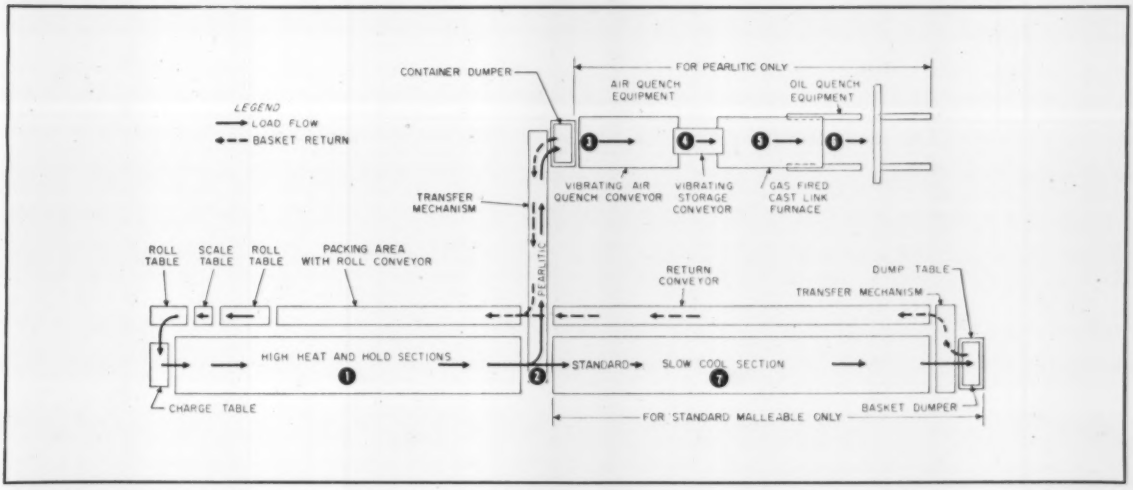
For example, when the **Marion Malleable Iron Works of Marion, Indiana,** set out to acquire "the most modern heat treating equipment which would be very flexible and produce highest quality at a nominal cost," they chose General Electric. The result: a complete system (at left and below) with integrated temperature and atmosphere controls and automatic handling equipment. With one packer and one operator, this system produces 1000 tons of standard malleable iron per month. Or 800 tons of pearlitic and 200 tons of standard malleable per month. Or, with the addition of a separate high temperature furnace, 1000 tons of standard malleable and 800 tons of pearlitic malleable per month. And depending on the type of material required, each of the seven automatic functions (below) can be varied as desired.

In addition, the automatically-controlled annealing cycle has been cut from five days to just 40 hours—a 75% speed-up! Quality is up, and controlled atmosphere (Neutralene) has practically eliminated surface decarburization and assures maximum alloy life of furnace components. Fuel costs are less because of shorter cycles, and labor costs are down. Flexible enough to produce either ferritic or pearlitic malleable, the furnace can even be left loaded and unattended over weekends to allow five-day operation.

As a result, Marion Malleable can offer a higher quality product and rapid delivery to its customers, and thanks to the savings of the G-E system, at a very nominal cost.

If you're planning a new heat processing installation or modernization—gas or electric, large or small, with or without atmosphere and materials handling equipment—it will pay you to contact your General Electric Apparatus Sales Office. General Electric Co., Section 721-26, Schenectady 5, N. Y.

GENERAL ELECTRIC



ONE SYSTEM, SEVEN JOBS. This complete heat processing system, designed and built by General Electric, automatically (1) heats and holds at temperature, (2) transfers and dumps, (3) air quenches, (4) reloads, (5) reheats, (6) oil quenches, or (7) slow-cools 1000 tons of castings per month with maximum flexibility. Note that two heat processes—pearlitic and standard malleable—can take place simultaneously, depending on mixture of material being processed, and yet work baskets are handled automatically from the time they are placed on the entrance table until the entire cycle is completed.

Ask HEVI-DUTY

...The Brush Beryllium Company did...

and assured 'round-the-clock production of pure beryllium billets with HEVI-DUTY pit-type vacuum furnaces

Operating continuously, two Hevi-Duty pit-type vacuum furnaces produce high-purity beryllium billets. The framework over the furnaces supports the presses. Forged heat shields for the test models of Project Mercury's space capsule are being manufactured by Brush Beryllium from billets produced in these furnaces.

Two tons of high-purity beryllium billets are produced every week in two Hevi-Duty vacuum furnaces at The Brush Beryllium Company, Elmore, Ohio. These specially engineered, double pump vacuum furnaces operate continuously—24 hours a day; 7 days a week. They produce billets up to 40" diameter by 40" high. Brush Beryllium selected Hevi-Duty furnaces for continuous and simultaneous application of heat, vacuum and pressure. Beryllium powder is sintered at 1050° C. and subjected to 400 psi pressure inside the furnace retort. Three zones of control provide fast heating response, and assure the desired, uniform temperature. A 2000 micron vacuum is maintained at the high temperature, and during the cooling cycle.

Hevi-Duty offers standard bell or pit-type vacuum furnaces for operation to 2000° F. (2100° F. for intermittent service).

Hevi-Duty engineers can help you find the effective solution to most of your heat application problems. Whether it is a standard or special job, Hevi-Duty designs and builds the electric or fuel-fired furnace for most processing requirements.

HEVI-DUTY

A DIVISION OF BPC BASIC PRODUCTS CORPORATION

ASK HEVI-DUTY
for more information about vacuum furnaces with operating temperatures to 2100° F.
Write for Bulletins 557 and 653A.

HEVI-DUTY ELECTRIC COMPANY, MILWAUKEE 1, WISCONSIN

Industrial Furnaces and Ovens, Electric and Fuel • Laboratory Furnaces • Dry Type Transformers • Constant Current Regulators

Geneva Works shears hot rolled strip on high-speed Wean line

This high-speed Wean line for shearing hot rolled strip enables the Columbia-Geneva Steel Division of U. S. Steel to furnish its customers with top-quality sheets to meet a wide range of requirements. Designed to handle coils in widths up to 72″, it provides for fast, accurate side trimming, shearing, and leveling. Equipment in the line includes a McKay processing uncoiler (with coil opener), flying shear, scrap chopper, and leveler.

Whatever your needs for continuous steel processing lines, it will pay you to take advantage of Wean *creative engineering.*

We will welcome the opportunity to discuss your requirements with you at your convenience.

WEAN

THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO

ON THE BALL

TIMES A DAY BRIDGEPORT Free-Machining Brass Rod!

Because ball point pens are in everyday use, production of vital brass tips becomes astronomical along with quality control problems.

These tips — one of which is shown much enlarged — are produced at ultra-high speeds. The brass rod needed for them must be flawless in every respect. *Consistent* metallurgical composition, *precise* dimensional tolerances and *unvarying* standards of machinability — if any of these qualities vary even a fraction, production comes to a frequent and costly halt.

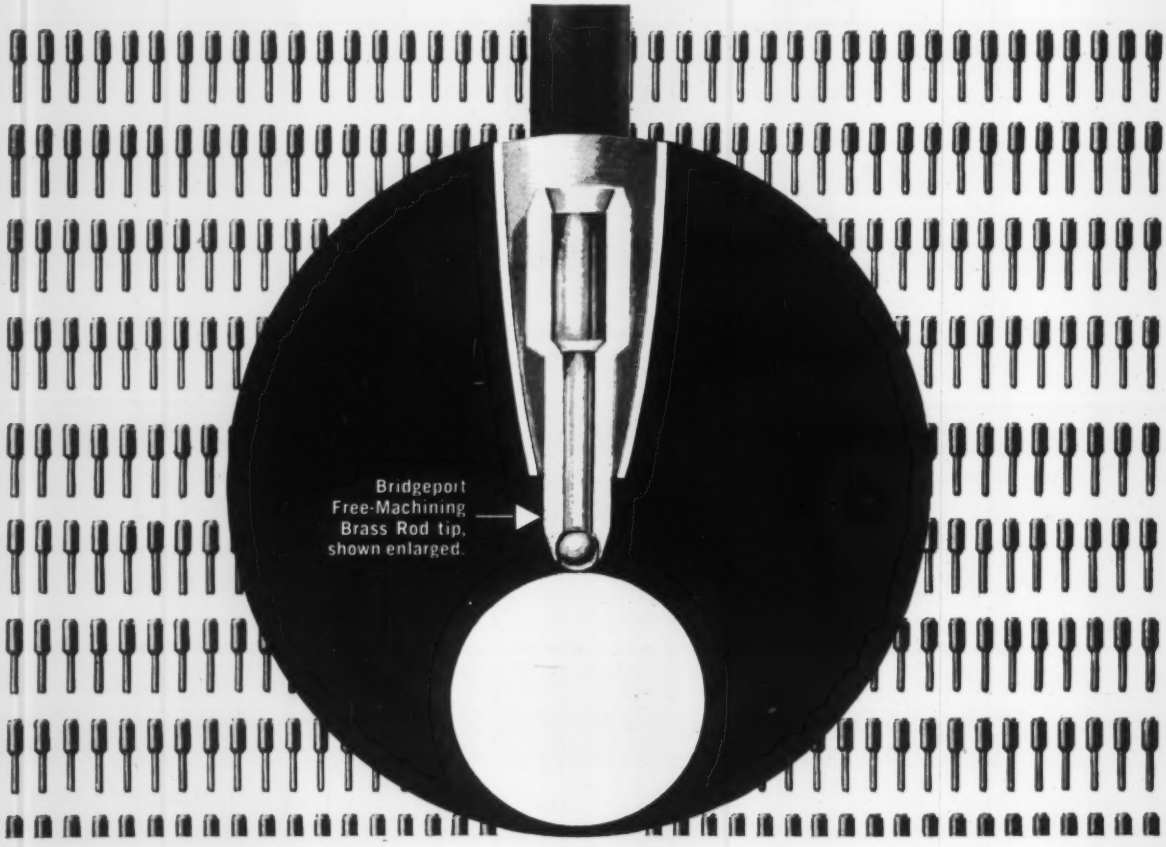
That's why Revere Metal Art Co., Inc., New York City, specifies Bridgeport Free-Machining Ball Point Pen Brass Rod for these inserts. It meets all requirements for precision, straightness, workability, machinability and tolerances —and, in addition, provides a surface finish that keeps finishing time and costs to a minimum.

Whether you use rod, strip or tube, you can count—just as Revere does—on getting consistent quality every time you specify Bridgeport Brass Alloys. It will pay you to get the complete story. Call your nearest Bridgeport Sales Office or write us direct for a complete list of Bridgeport products—Dept. 3912.

BRIDGEPORT BRASS COMPANY

BRIDGEPORT 2, CONNECTICUT

Specialists in Metals from **A***luminum to* **Z***irconium*



IT PAYS TO STANDARDIZE ON **STANSCREW**

Lag Bolts Expand Stanscrew Line To Over 5,500 Different Fasteners

Hex machine bolts . . . carriage bolts . . . and now, a broad selection of lag bolts . . . all quickly available from Stanscrew.

These new gimlet point lag bolts, all with full-sized shanks, conform to ASA Standards and are produced to Stanscrew's rigid criteria of fastener quality. Almost 100 sizes are offered as stock items.

With lag bolts, the Stanscrew line now covers more than 5,500 standard catalogued fasteners . . . carefully developed to answer the overwhelming majority of American industrial needs. Included are socket, set, and cap screws . . . nuts . . . dowel and taper pins . . . pipe plugs . . . studs . . . and, of course, Stanscrew's complete bolt series.

Each of these 5,500 fasteners is always in stock at three conveniently located plants. A rigidly enforced Stanscrew policy assures regular orders are shipped within 24 hours. This means your Stanscrew distributor can provide especially fast service on all occasions . . . and be particularly helpful in emergencies.

Your Stanscrew distributor will also be happy to arrange a visit from the Stanscrew fastener specialist. His recommendations on your assembly procedures can often result in significant savings. Why not call your Stanscrew distributor today?

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois

What do you want in an inclinable?

AIR FRICTION CLUTCH? MECHANICAL CLUTCH?
FLYWHEEL OR GEARED PRESS?
SINGLE OR DOUBLE CRANK? AUTOMATIC FEEDS?
10 TON...200 TON?

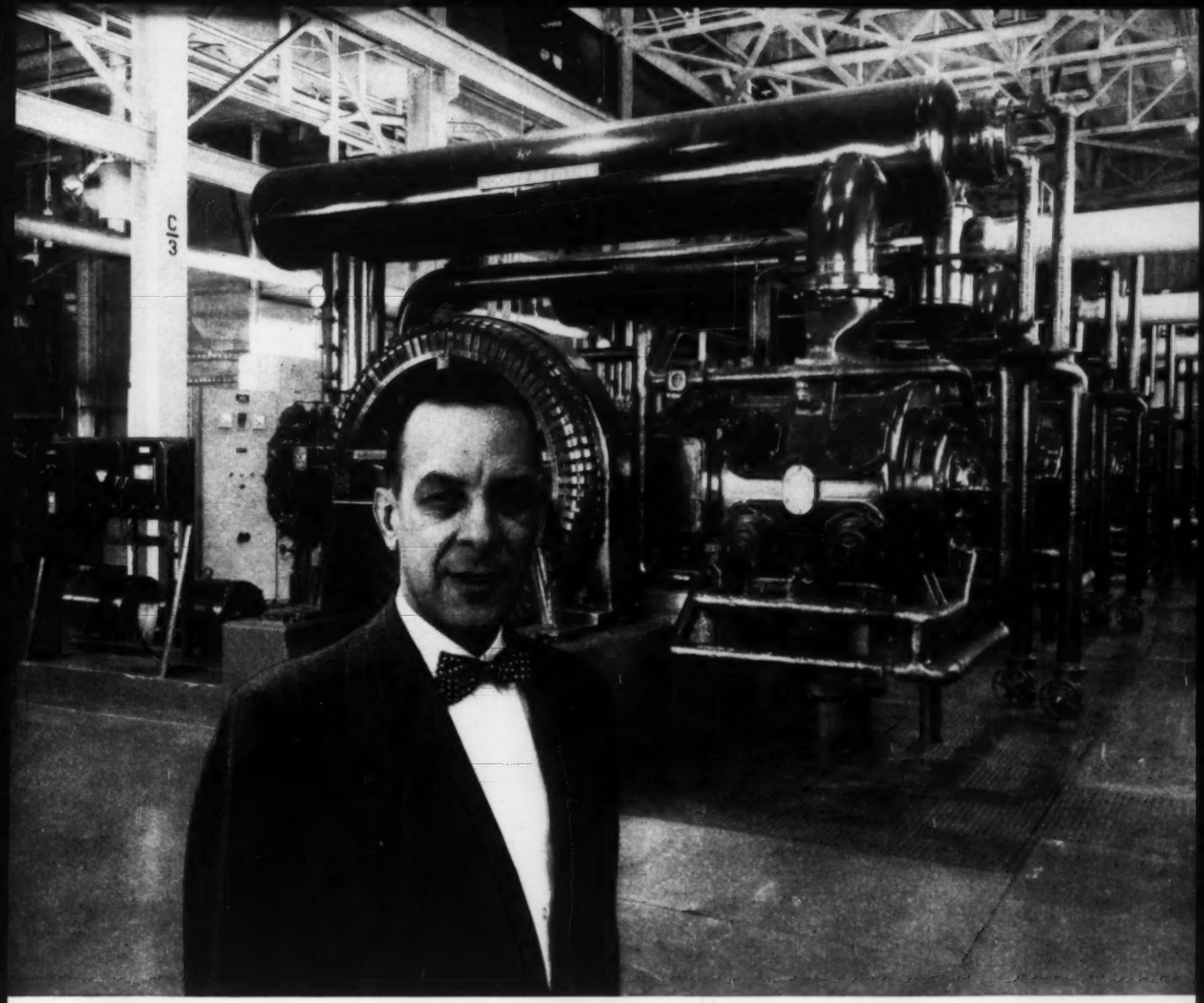
Don't settle for "second-best" when the best may cost you less! Chances are whatever your needs in an inclinable, it's a Bliss standard—simply because Bliss makes more types and sizes of inclinable presses than any other builder. In fact, someone else's "special" may be a Bliss standard. Check it out for yourself before you buy—write for our most recent inclinable catalogs and data sheets. You'll see that size for size, no matter what you want in an inclinable, you get more press from Bliss ... large crankpins, long strokes, greater openings, bigger beds and many other extra values. A press that's backed by a century of press engineering ... by competent counsel ... by a **dependable** parts and service program. In short, you'd be wise to check Bliss—**first!**

E. W. BLISS COMPANY
Canton, Ohio

BLISS
SINCE 1857

Bliss is more than a name...
it's a guarantee!

PRESSES • ROLLING MILLS • ROLLS
DIE SETS • CAN MACHINERY • CONTRACT MANUFACTURING



Grover H. Detmer, *Project Engineer,*
The Cooper-Bessemer Corporation, explains...

How Cooper-Bessemer compressors supply air for Ford assembly

Compressed air plays an important part in the production operations of the new Ford assembly plant in Lorain, Ohio. Behind this supply, you'll find four 400 hp Cooper-Bessemer compressors with En-Tronic controls. Housed in the power plant building, these units discharge at 104 lbs. pressure. Mains of 8" size carry the air about 1000 feet to the far ends of the huge plant. Pressure there is 98 lbs. The 5-step capacity controls automatically load the compressors to meet plant demands for air.

The Cooper-Bessemer equipment has been in use constantly since the plant was completed a year ago and have given excellent service.

Cooper-Bessemer M-line compressors for industrial air supply are available in sizes from 200 to 10,000 hp. Write for free copy of Bulletin M-81, "Air for Industry."

BRANCH OFFICES: Grove City • New York • Washington • Gloucester
Chicago • Minneapolis • St. Louis • Kansas City • Tulsa • New Orleans
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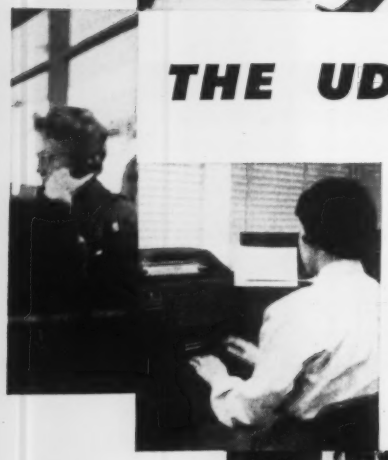
Cooper Bessemer

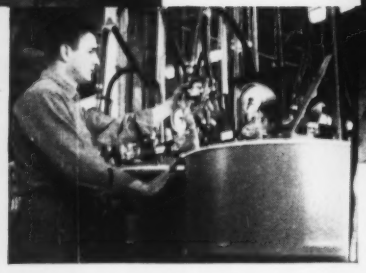
GENERAL OFFICES: MOUNT VERNON, OHIO

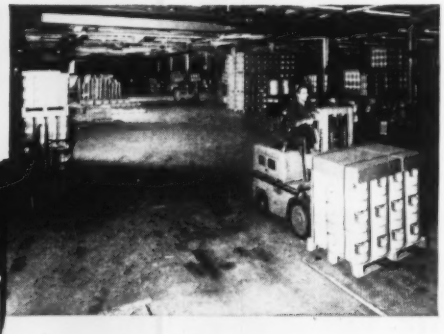
ENGINES - GAS - DIESEL - GAS-DIESEL
COMPRESSORS - RECIPROCATING AND CENTRIFUGAL
ENGINE OR MOTOR DRIVEN

plating progress ✻

THE UDYLITE SUPPLY NETWORK





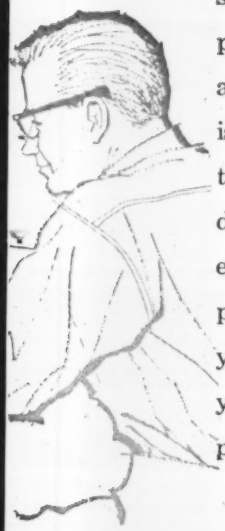


world's largest plating supplier

the **udylite**

corporation

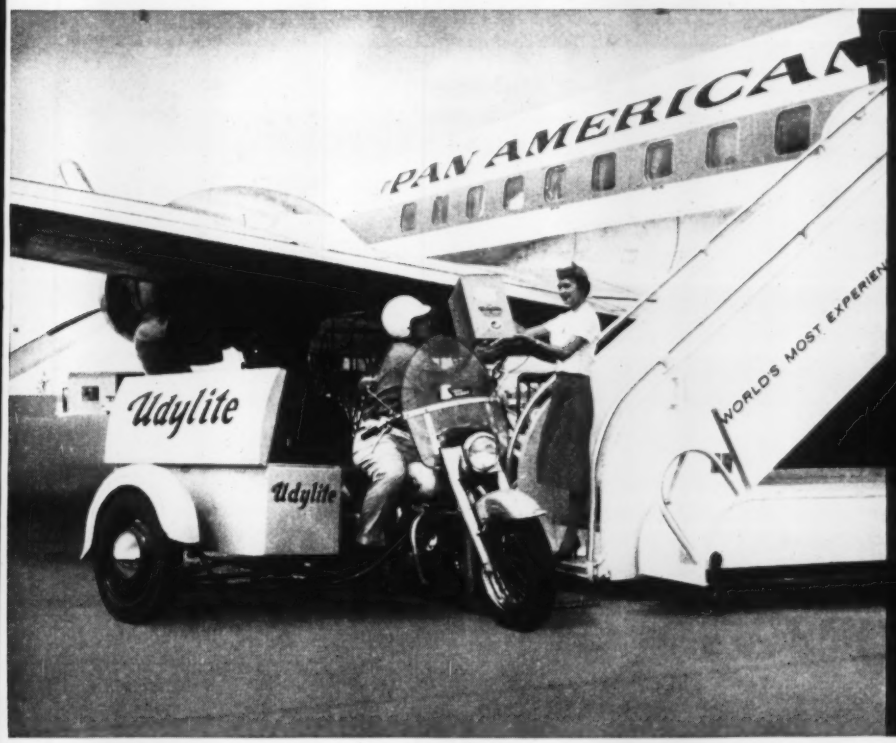
detroit 11, michigan



Telephone, teletype and cable, a globe-circling network of depots, the speed of jet-age transportation are all at your command when you order plating supplies from Udylite. The supplies service team comprising a large and intricate complex of communications, warehousing, and personnel is set in motion with the receipt of your order. What you *get* is the finest quality, the newest exclusive processes, in the most advanced packaging available, delivered with exactness, and speed. Within twenty-four hours—even less if necessary—your order can be on its way to you from the nearest point of availability. In time to keep your production line moving you receive your Udylite supplies, of quality, weight and price you know you can depend upon. This is indeed "worry-free" buying provided for you by Udylite.

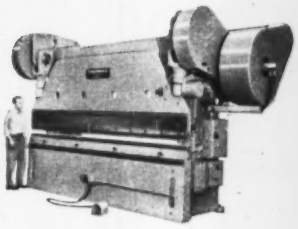
MEANS WORRY-FREE BUYING FOR YOU

...helps guarantee your production quotas

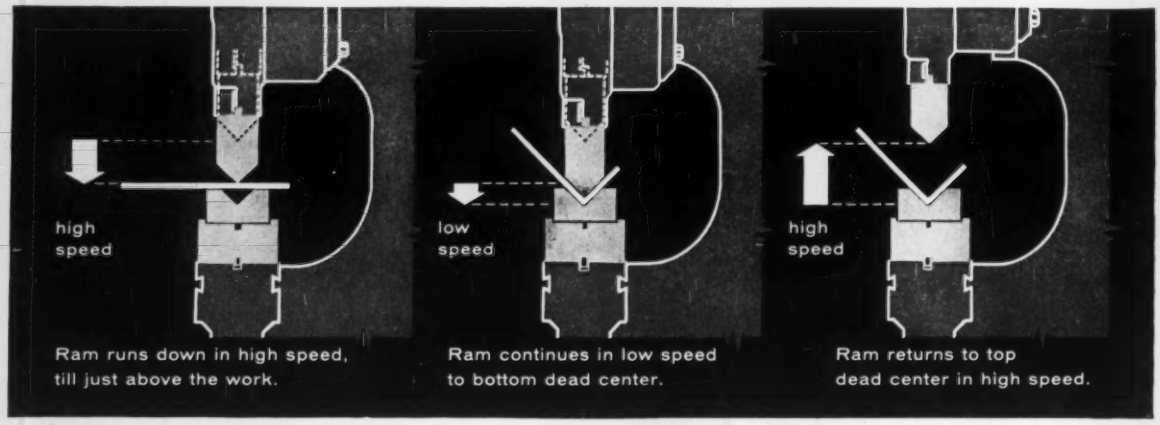


* Not customary but entirely "in order" is this shipment, rushed by Udylite messenger directly to planeside in Detroit for emergency delivery to a customer in Johannesburg, South Africa. The delivery was made in just 39 hours at a distance of 9036 miles in time to avert a production halt and provide the customer with typical Udylite supply service satisfaction. Udylite special delivery joins with the world's speediest common carriers to deliver your order tomorrow, if that's how fast you need it.

INCREASE PRODUCTION AS MUCH AS 60% WITH CINCINNATI®



Automatic Cycle Press Brakes


high speed
low speed
high speed
Ram runs down in high speed, till just above the work.
Ram continues in low speed to bottom dead center.
Ram returns to top dead center in high speed.

If you form long, flexible parts, you can increase your production up to 60% with a Cincinnati Automatic Cycle Press Brake.

A new, exclusive feature, the Cincinnati Automatic Cycle provides a combination of instantaneous fast and slow ram speeds with every stroke. As a result, you get maximum production speed without the "whip up" and "back bending" which often occur in high speed forming of long parts which have no beam strength.

You no longer have to rely on the operator's skill at clutch slipping to obtain parts that are free of "back bends."

You can get this money-making feature on all new 7 and 9 Series Cincinnati Press Brakes.

This productive new feature means a lot of advantages for you:

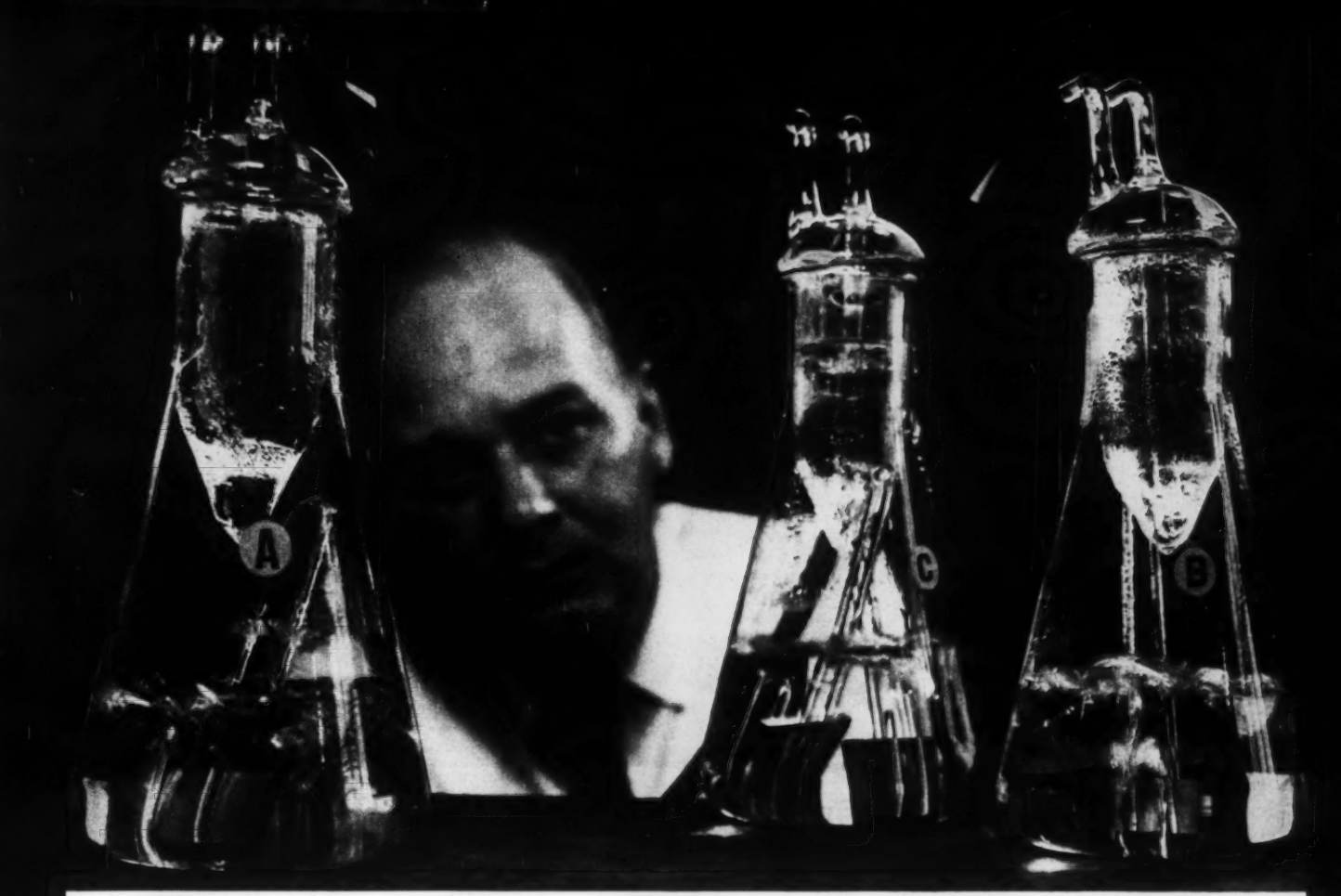
1. Job records show 10% to 60% increase in parts formed per hour.
2. Low speed portion of the ram stroke can be set so that all strokes are identical in length.
3. Rejects caused by "back bends" are stopped.
4. Highly experienced operators are not required.
5. Operator fatigue is greatly reduced because there is no need for clutch slipping.
6. Clutch and brake are long-life, minimum-maintenance units requiring no adjustments.

Write Dept. C for full details about the Cincinnati Automatic Cycle, Bulletin B-9R.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.



Here, boiling nitric acid is used to evaluate the corrosion resistance of Jessop stainless steel plate.

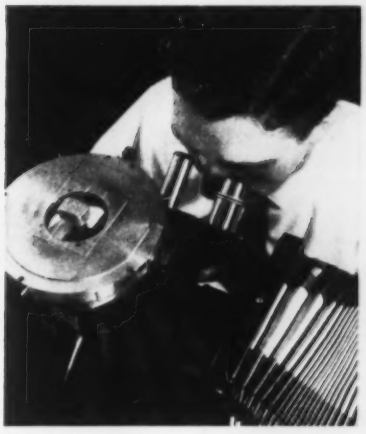
"How Jessop Tests Stainless Steel in Boiling Nitric Acid"

L. W. Cooper, Chief Metallurgist

"From experience, our customers know this is a fact: Specify Jessop for specialty steels . . . and then relax! Of the many reasons *why* this is true, here's one . . .

"In evaluating corrosion resistance, one of the procedures we use is the ASTM boiling nitric acid test. Standard and simple? Yes. But expert *evaluation* is of great importance to the customer. That's why, at Jessop, a top metallurgist closely supervises each of the five 48-hour test periods.

"*Overly cautious?* Because we're overly cautious in *every* phase of steel production and quality control, Jessop has earned the reputation for producing specialty steels tailor-made to the most exacting specs— *Specify Jessop . . . and then relax!*"



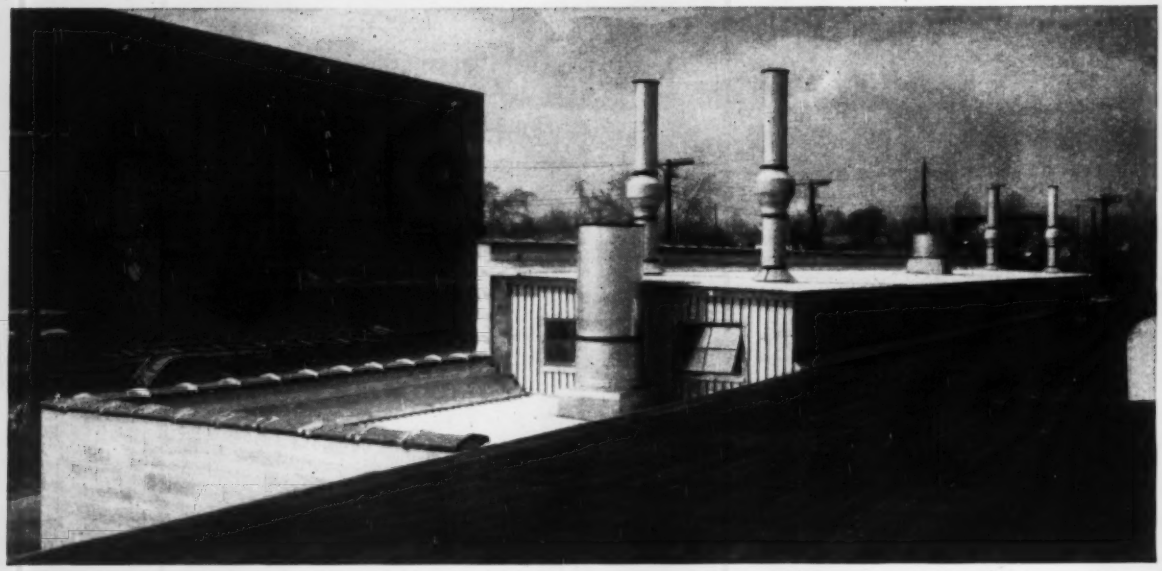
Checking the grain size of tool steel, this Jessop metallurgist uses a microscope with a camera attachment. VMA 6787

Green River Steel Corporation
Jessop Steel of Canada, Ltd.
Jessop Steel International Corporation
Steel Warehousing Corporation, Chicago

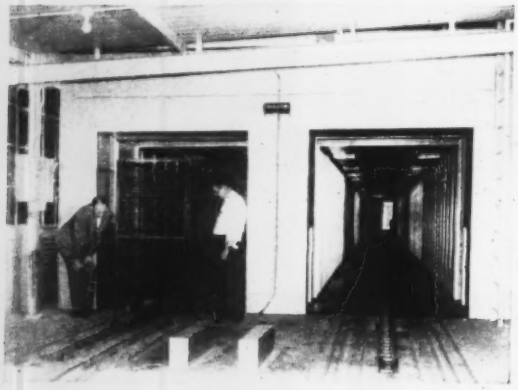
JESSOP
STEEL COMPANY
Washington, Pennsylvania

Stainless, alloy, tool, cast-to-shape, clad, and forging steels, ground flat stock and other specialty steels

FINISHING SYSTEMS...



Stout Sign Company Eliminates Production Bottleneck with Conveyorized Paint Baking Equipment!



In the two ovens above, installed at Stout Sign Company, St. Louis, Mo., uniform drying is accomplished by four recirculating zones in each oven. Hot air is forced across the oven by pressure and suction controlled by banks of narrow, vertical apertures in the oven walls which extend from floor to ceiling. These narrow apertures assure even distribution of hot recirculated air, and cause the air to flow horizontally through the sign racks and over the work. The direction of air flow is reversed in each successive zone. Air is recirculated at the rate of 13 oven volumes per minute.

Mahon engineers were called in to solve a paint-baking bottleneck in the production of metal signs painted with the silk screen process. This application process necessitates stacking freshly painted signs in a horizontal position, with only two inches of air space between, in specially built racks. Stout Signs had previously been baked in this manner in batch-type ovens.

The solution arrived at by Mahon engineers was two parallel tunnel-type, conveyorized ovens built as a single unit adjacent to the plant. Each oven was provided with independent temperature and conveyor speed controls and was designed to utilize existing sign drying racks which were modified and adapted to conveyor use.

The Stout Sign Company is now able to control temperature and time-length of the drying and baking process to meet any finish requirements . . . they are relieved of much manhandling of racks, and are free from excessive paint fumes and dust and lint troubles; production flows smoothly, and the quality of finish on their product is vastly improved.

The enthusiasm of a satisfied customer is best evidenced by the following excerpt from a letter recently received from Stout Sign Company: "Let me congratulate you and your entire engineering staff on an accomplishment beyond our expectations."

When you consider new finishing equipment or processing equipment of any type, you, too, will want to discuss your requirements with Mahon engineers.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York, Chicago, Los Angeles and San Francisco

Engineers and Manufacturers of Complete Conveyorized Finishing Systems: Metal Parts Washers, Metal Cleaning and Rust Proofing Machines, Conveyorized Cleaning and Pickling Machines; Dry-Off Ovens, Spray Booths, Electrostatic Spray Enclosures, Flow Coaters, Dip Coaters, Finish Baking Ovens, and Paint Stripping Equipment; Core Ovens, Soldering Ovens, Dehydrating Ovens, Heat Treating and Quenching Equipment for Aluminum and Magnesium; Dust and Fume Control Installations, and Many Other Units of Special Plant and Production Processing Equipment.

See Sweet's Plant Engineering File for Information and Representative Installations, or Write for Catalogue A-659

. . . the **EXPERIENCE** that goes into the **PLANNING** and **ENGINEERING** of **MAHON EQUIPMENT** is the item of **GREATEST VALUE to YOU!**

MAHON

"Been workin' her hard for 14 years ...she's as fast and accurate as the day she arrived"

NIAGARA SHEARS

Precision made Niagara Shears are built to cut with micrometer accuracy . . . *and to keep cutting that way.*

Thousands are in use, but comments are nearly identical. Makes no difference how hard they're worked. Three shifts a day, month after month, year after year . . . a Niagara Shear *continues* to be accurate.

"Don't have to change knife clearance"

No adjustments needed for cutting different thicknesses of stock . . . even at the same time . . . with consistently accurate, burr-free results. *And much longer knife life!* The secret is in the rigidity of Niagara's exclusive box section design. "Upped production 25%," says one user, "because we have fewer adjustments to make."

"Costs less to operate"

There's less to do, less to learn and less to go wrong. Never even have to worry about damaging the machine by forgetting to change the knife clearance. Once set, Niagara Shears need no further adjustment. "Been using Niagara's for 10 years . . . never had downtime for repairs or maintenance," says another user. Even after long, hard use when it becomes necessary to turn the blades or change knives, it's a very easy matter. Nothing like Niagara Shears for simplicity.

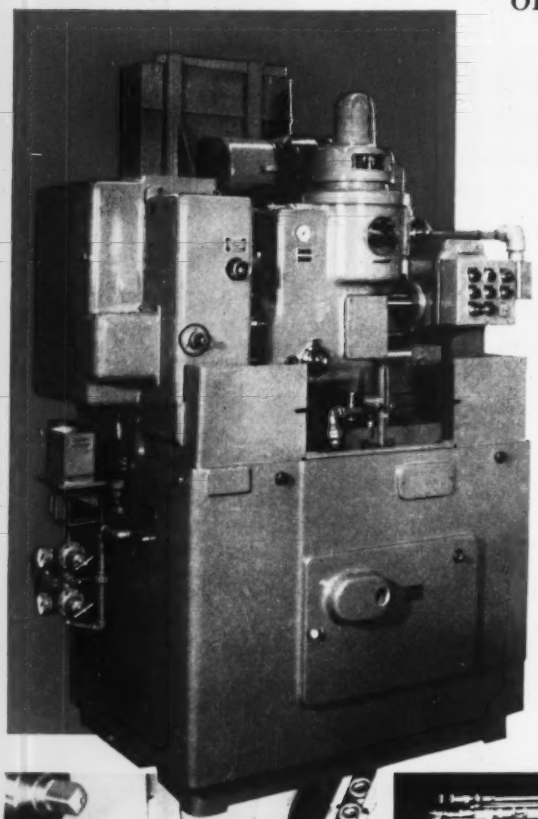
FACT BOOK FOR YOU

Bulletin 69 is filled with customer reports on Niagara Shear performance. You'll value it. Write today.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y. *District Offices and Distributors in Principal Cities*

AUTOMATIC WORK HANDLING

Is A Natural Complement to the High Production Rates of the Fellows 4GS Gear Shaper

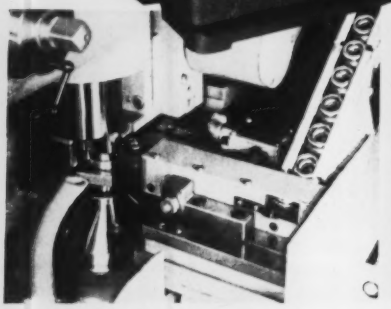


Although designed for both manual and automatic loading, the 4GS Fellows Gear Shaper makes best use of its high production rates when equipped with work handling devices.

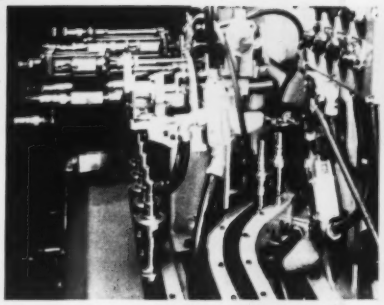
The physical construction of the machine is such that it may be easily adapted for use with magazines and chutes for automatic loading and unloading at substantial cost savings on continuous production runs.

Ask your Fellows representative about the many advantages of automatic work handling with the 4GS Fellows Gear Shaper, or write direct to the Fellows Gear Shaper Company.

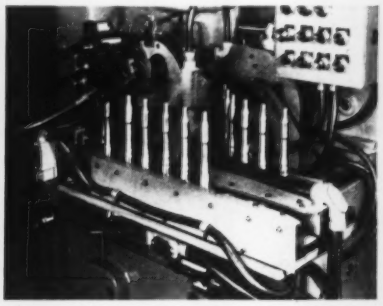
THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont, U. S. A.
Branch Offices:
1048 North Woodward Ave., Royal Oak, Mich.
150 West Pleasant Ave., Maywood, N. J.
5835 West North Avenue, Chicago 39
6214 West Manchester Ave., Los Angeles 45



These internal clutch parts are fed automatically from a vibratory feeder down a chute to the magazine slide from which they are located and clamped. The cutter spindle is automatically stopped at the top of its stroke for clearance during the loading and unloading cycle. Cutting time is 1½ minutes. *Gear Data:* 10 Teeth, 12.4 Pitch (Stubbed), 30° Pressure Angle, Spur, 5/32″ Face Width.



This transmission cluster gear shaft is handled by two sets of air-operated "fingers" mounted on a turret. As the turret rotates, one set of fingers moves the finished piece to the unloading chute while the other set brings the new blank into position. Cutting time is 35 seconds. *Gear Data:* 10 Teeth, 12.4 Pitch (Stubbed), 30° Pressure Angle, External Spur, 5/32″ Face Width.



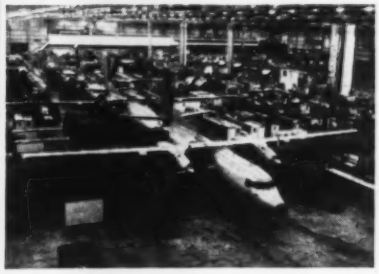
This automotive stem pinion is handled in the same manner as the cluster gear. In both cases, safety devices prevent the machine from starting unless the blanks are in the correct cutting position. Loading and unloading chutes may be hand or conveyor fed. Cutting time is 2½ minutes. *Gear Data:* 17 Teeth, 10 Pitch, 19° 30′ Pressure Angle, 32° 51′ Helix Angle, ⅝″ Face Width.

THE PRECISION LINE

Fellows *Gear Production Equipment*

New Trend in Steel Buying: Many profit-conscious manufacturers taking a long, hard look at steel buying policies; more and more of them cutting costs by purchasing more steel *as it's needed and ready for production* from modern Steel Service Centers.

"Critically needed alloys make 24-hour deliveries a must!"



Prompt deliveries from U. S. Steel Supply help keep this F-27 production line on the move!

The Fairchild F-27, first American-made turbine-powered airliner.

says Mr. V. N. Thacker, Assistant Materials Manager, Fairchild Aircraft & Missiles Division, Fairchild Engine & Airplane Corporation, Hagerstown, Maryland

"We're now producing the first American-made turbine-powered airliner—the Fairchild F-27 Propjet," says Mr. Thacker. "Naturally, during the first months of production with an all-new aircraft modifications are necessary. But despite these changes, which result in last-minute orders, U. S. Steel Supply gives us delivery of the material we need . . . when we need it.

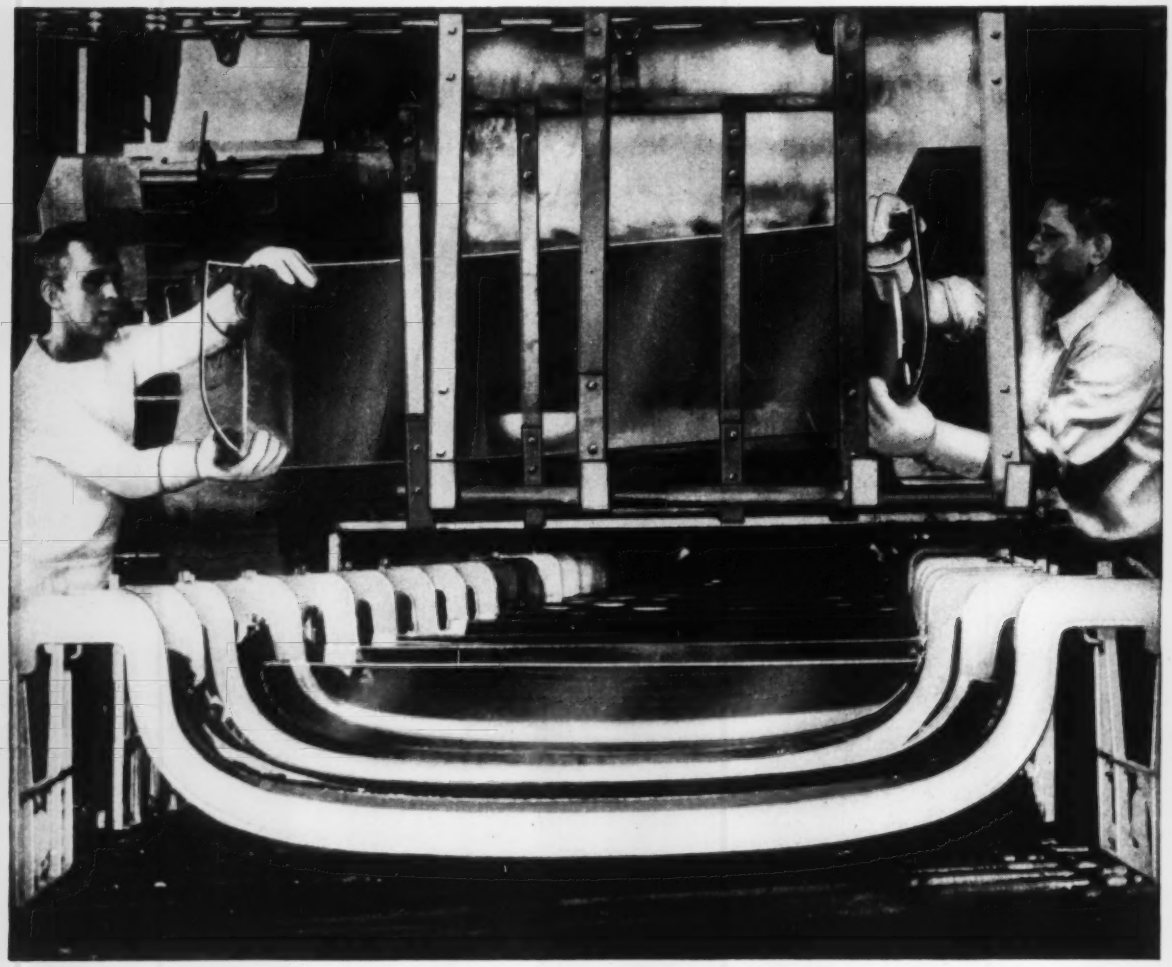
"Here's an example: We ordered 50 feet of 4130 steel, measuring ⅜" x 1", which we needed within 24 hours. Granted, it was a small order, but it was *vital* to the F-27. U. S. Steel Supply delivered it in less than a day, saving many valuable man-hours."

Why not take a close look at *your* steel buying policies—you'll find U. S. Steel Supply's pamphlet entitled "Value Analysis at Work" very helpful. Write to our Chicago Office, or call your nearest U.S. Steel Supply Steel Service Center. You'll find us in the Yellow Pages listed under *Steel*.

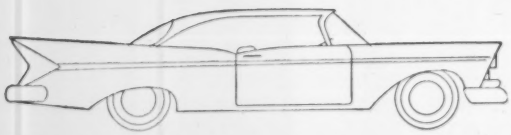
USS is a registered trademark

U. S. Steel Supply Division of USS United States Steel

Steel Service Centers and Complete Steel Strapping Service at: Baltimore, Birmingham, Boston, Chicago, Moline, Cleveland, Houston, Dallas, Los Angeles, Memphis, Milwaukee, Newark, Southington (Conn.), Philadelphia, Seattle, Portland (Ore.), Pittsburgh, St. Louis, St. Paul, San Francisco. • General Offices: 208 South LaSalle Street, Chicago 4, Ill.



Greater visibility, trimmer lines in new car styling... thanks to GAS



With nearly 7,000,000 cars being produced annually, the increased use of glass has demanded major production improvements in the manufacture of new panoramic windshields and back-lights.

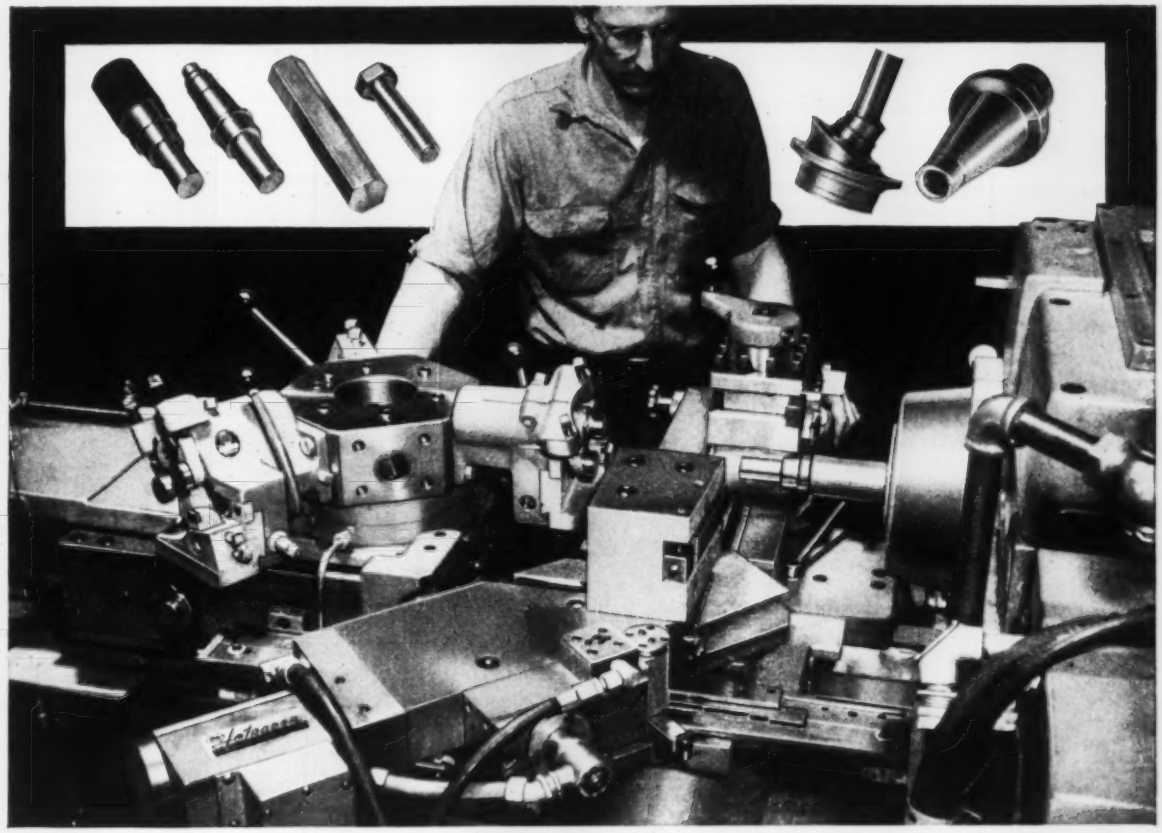
Since the forming of the intricately curved glass is done at a temperature at which glass is soft and can be bent, the production process challenged heat process engineers to design new automatic equipment capable of mass producing these large precision glass pieces.

Selas engineers, working with the nation's leading glass manufacturer, discovered that Gas could produce the proper time-temperature cycle demanded by this process, efficiently, quickly, reliably. The flat glass is conveyed under radiant Gas burners which bring the glass quickly up to bending temperature and allow the shaping of windshields, with reproducible uniformity, at high production rates.

The production of this wrap-around windshield is another example of the contributions modern Gas equipment is making to American manufacturing. If you have an operation demanding precise process heating, call your local Gas Company's Industrial Specialist and discuss the economies and results you, too, can get with modern Gas equipment. *American Gas Association.*

See Playhouse 90 with Julia Meade on CBS-TV. Watch local listings for time and station. Sponsored by your Gas Company and the Gas Industry.

Want to cut costs on parts like these?



Here's how tracing will help you save

The simple, basic setup shown above handles nearly 300 different parts for a well-known manufacturer of drive line components. All work is performed on one Gisholt MASTERLINE No. 4 Ram Type Turret Lathe with a JETracer on the rear of the cross slide. Standard tools on the hex and square turrets are used to face, chamfer and reduce the stock while the JETracer finishes all diameters, steps, blends and radii. The $6\frac{9}{16}$"-long, 2"-diameter stepped shaft (above at left) is typical and is completed in two operations with total f.t.f. time only 4.95 minutes.

Here are just a few things the JETracer can do for you:

- **Shorten setup and change-over time**
- **Simplify machining and eliminate operator errors**
- **Save cost of form tools, multiple tool blocks and holders**
- **Reduce inspection time (only one length and one diameter need checking)**
- **Minimize or eliminate secondary operations (through finer finish, greater accuracy)**
- **Increase production through automatic machining of complex surfaces**
- **Free operator to handle extra units or perform other work**

Gisholt has developed a complete line of JETracers for use with ram and saddle type turret lathes, automatic turret lathes and single-spindle chucking lathes. These include rear cross slide, turret and independent slide mounted units, single or multi-pass types. *All are designed to operate at full capacity of the machines to which they are applied, without limiting machine functions or restricting the use of standard tools.*

You'll want to see for yourself how the JETracer adds flexibility, speeds operations and cuts costs on standard and problem parts. Send the coupon today for your free copy of the new JETracer catalog, or call your Gisholt Representative for complete information.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE

Gisholt Machine Company
1217 E. Washington Ave.
Madison 10, Wisconsin

Please send a copy of the new Gisholt JETracer catalog.

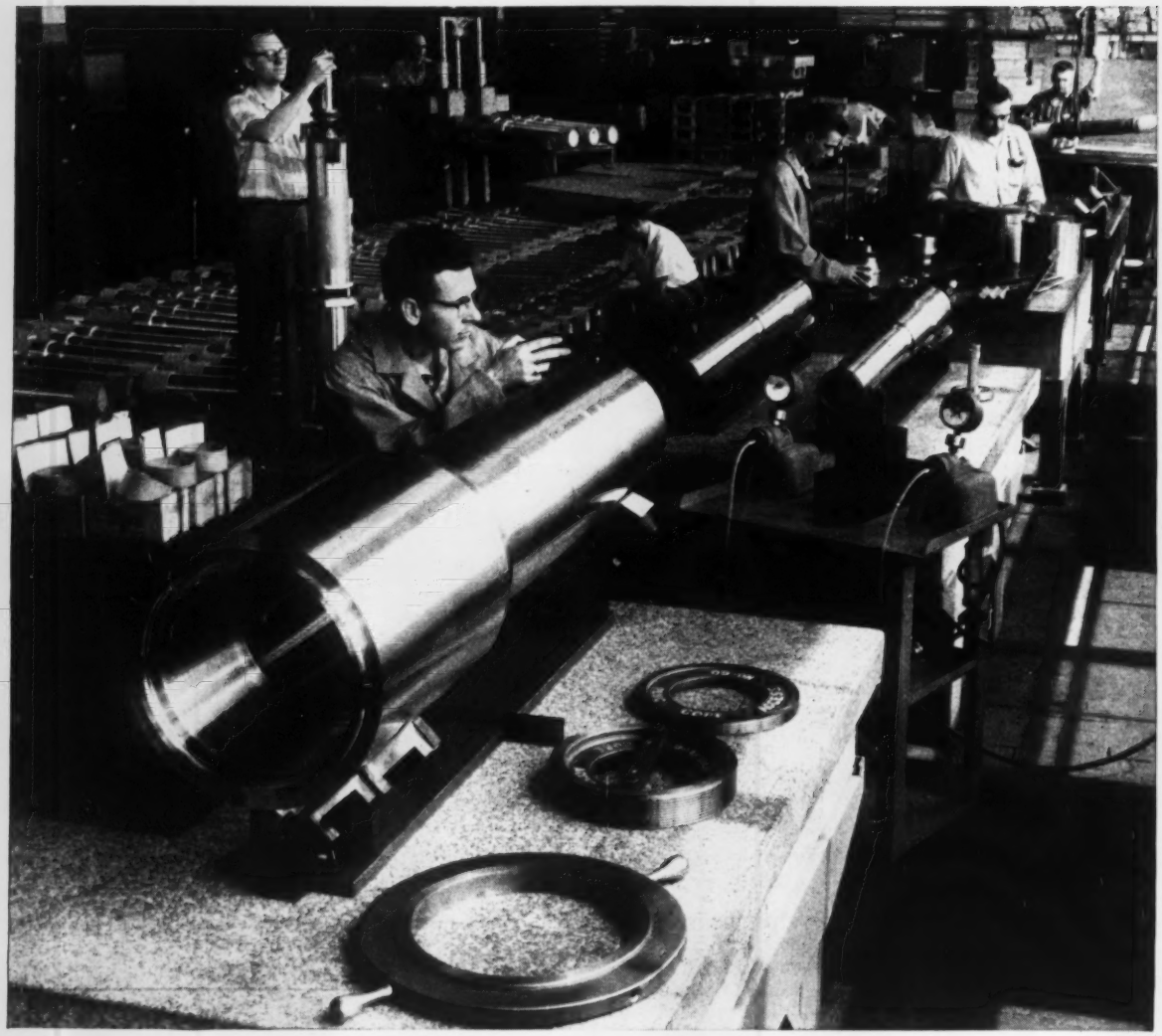
Name ..... *Title* .....

Company .....

Street address .....

City ..... *Zone* ..... *State* .....

SPS RELIABILITY / *A dynamic standard of predictable performance*



SPS Nuclear Division inspector in foreground verifies 12 in. OD of reactor vessel core access housing. Tolerance: ±.001 inch. Precision granite surface plate assures absolutely level test bed, eliminates slightest distortion of jigs. Typical reactor vessel closure head incorporates some 50 of these large precision-machined housings—for control rods, instrument packages and access.

No random sampling here . . .

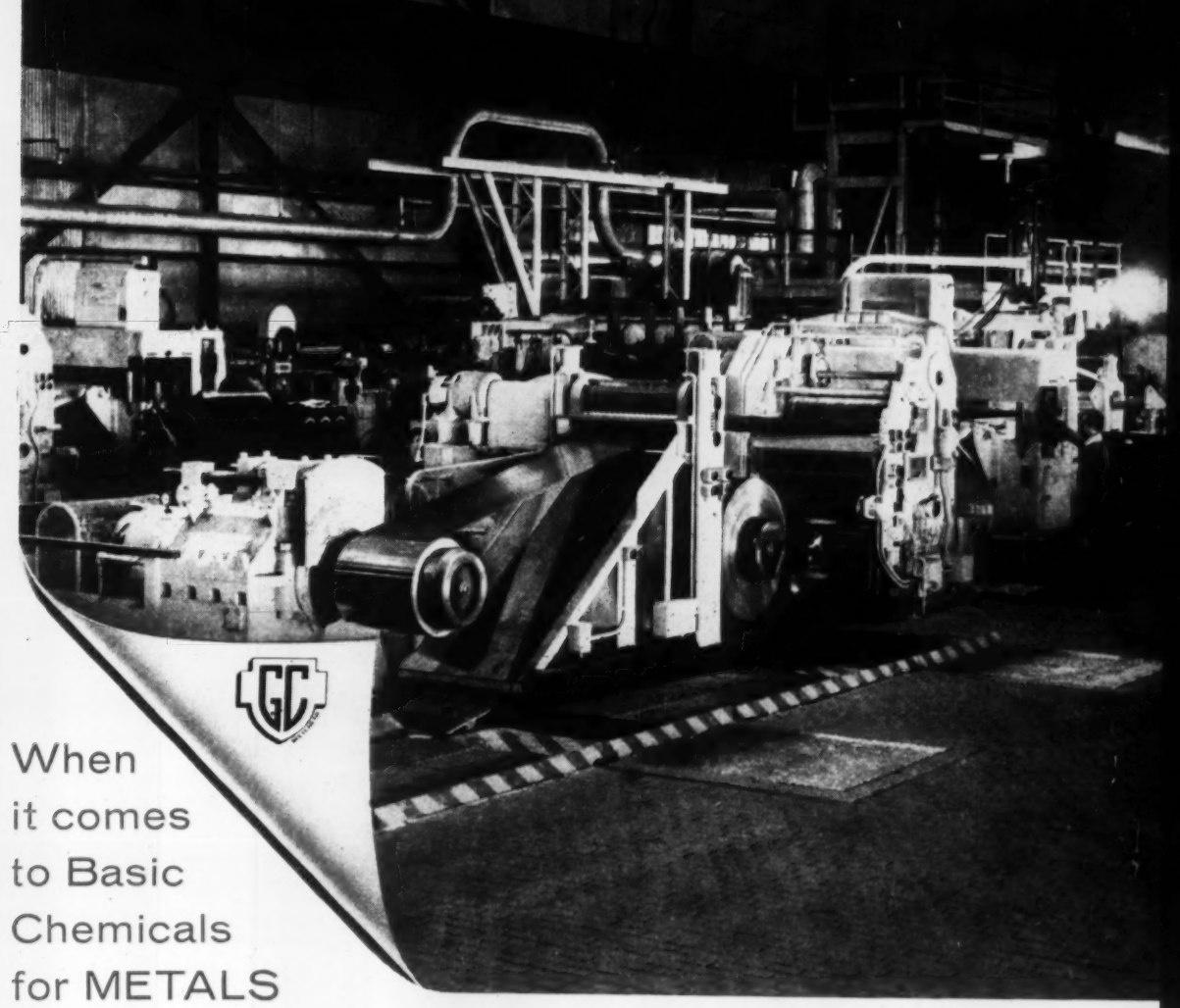
Parts reaching this final inspection area at the SPS Nuclear Components Division are already documented by detailed records of their dimensions. Presumably they are perfect. Yet to be certain, the records are put aside and every dimension of every part is checked and recorded again—and then cross-checked against the original figures. With a part such as the large core access housing in the foreground, this involves over 200 measurements, many to ±.0005 inch.

To make these checks, SPS technicians draw on more than $3 million worth of precision gaging, including the very latest air and electronic equipment. Most of this is of the comparator type, designed to eliminate possible misreadings, which sometimes occur with vernier scales.

Why this emphasis on perfection? Simply because these parts must function with 100% reliability in locations that are often made inaccessible by radiation. If you have requirements for such components (for reactors or for conventional power-producing machinery), contact SPS—manufacturer of precision threaded fasteners and allied products in many metals, including titanium. Request new Folder 2499.

NUCLEAR COMPONENTS Division SPS

JENKINTOWN 33, PENNSYLVANIA



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it comes
to Basic
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for METALS

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There are good basic reasons for making General Chemical your source of supply for basic chemicals. Our large-scale production is one. Long experience is another. And there are many more—including consistent high quality and uniformity of product... top-notch technical service... a coast-to-coast network of plants and distribution points... plus efficient follow-through from order to delivery and beyond that to satisfactory performance. That's why—when it comes to basic chemicals—it's wise to come to General Chemical for all these products....

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Sodium Metasilicate	Iron Fluoborate
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GENERAL CHEMICAL DIVISION
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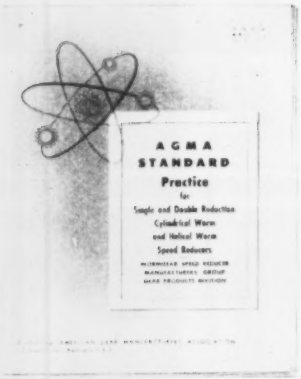
DE LAVAL offers new A.G.M.A. Gear Standards Booklet for Engineers

You will not want to be without this newly published American Gear Manufacturers Association booklet. It outlines the new standards for single and double reduction cylindrical worm and helical worm speed reducers.



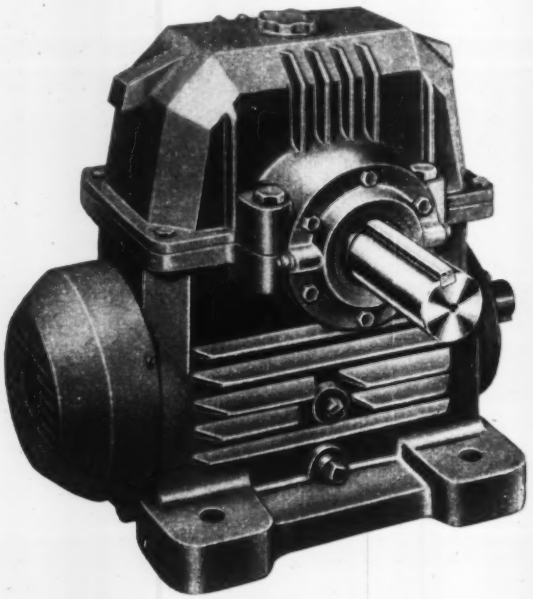
Get this new A.G.M.A. 440.03 booklet free of charge by request on your company letterhead.

This new standards booklet contains important design data including: Power rating of worm gears • Ratio correction factor (Km) • Materials factors (Ks) • Velocity factor (Kv) • Coefficient of friction (μ) • Thermal factor • Service factors • Efficiency • Overhung load capacity • Lubrication.

The materials factor (Ks) and the coefficient of friction (μ) are new, reflecting the latest advances made in worm gearing in the past few years.

We have also recently published our new Delroyd Worm Gear Sets Catalog 3800 and Delroyd Single Reduction Worm Gear Catalog 3805, which contain comprehensive information on the selection of these units.

De Laval furnishes worm gearing under the trade name DELROYD and has a complete line from 1⅛" to 36" center distance, in horsepower ranges from .04 to 700 and in ratios from 5: to 4900:.



DE LAVAL *Steam Turbine Company*

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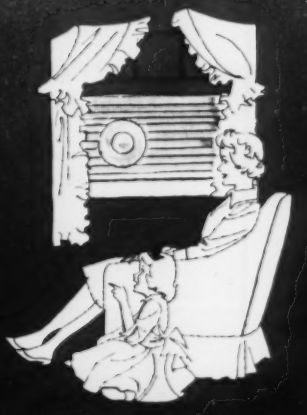
QUALITY

It's in our steel

so it's in your products



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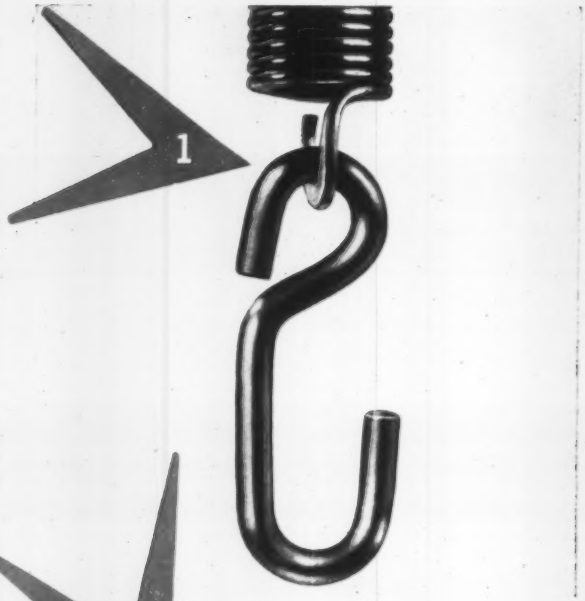
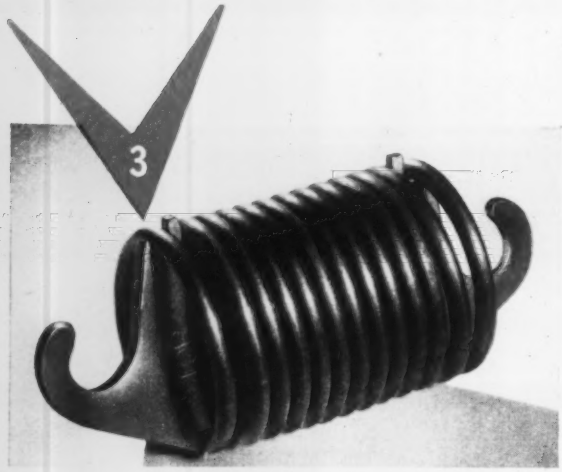
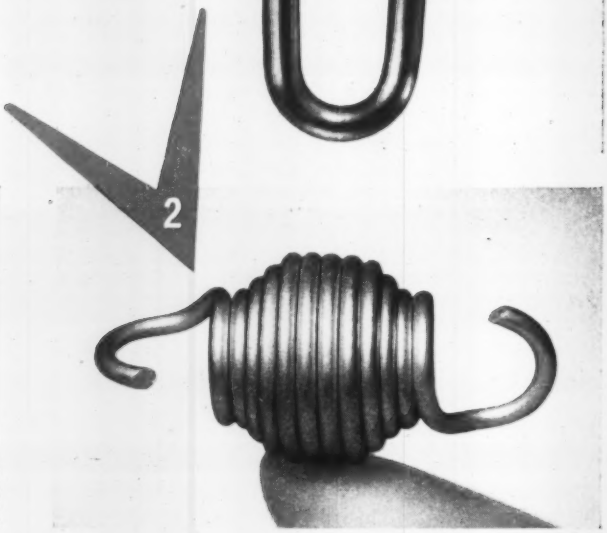
Why it pays to look at the end in the beginning







1. In this pick-arm spring for a textile machine, natural frequency vibration plus rigid end restraint caused early failure. By redesigning spring and adding swivel hook to end assembly, failure was avoided and cost reduced as well.

2. Fatigue failure caused by bending stresses occurs where end hooks join working coils. In this method of reducing the combined stress, two coils at each end are wound with a reduced diameter.

3. Another method for reducing stress concentration where end hooks join coils is to thread a flat stamping into end coils.

Here are a few examples of why it pays to call on the springmaker early in your design problems. End-hook failure of extension springs is a common occurrence that experience can help avoid. Check your specifications for performance and production economy by consulting an A.S.C. spring engineer. Write for bulletin "How to Solve Your Spring Design Problems."

Associated Spring Corporation

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B-G-R Division, Plymouth and Ann Arbor, Mich.
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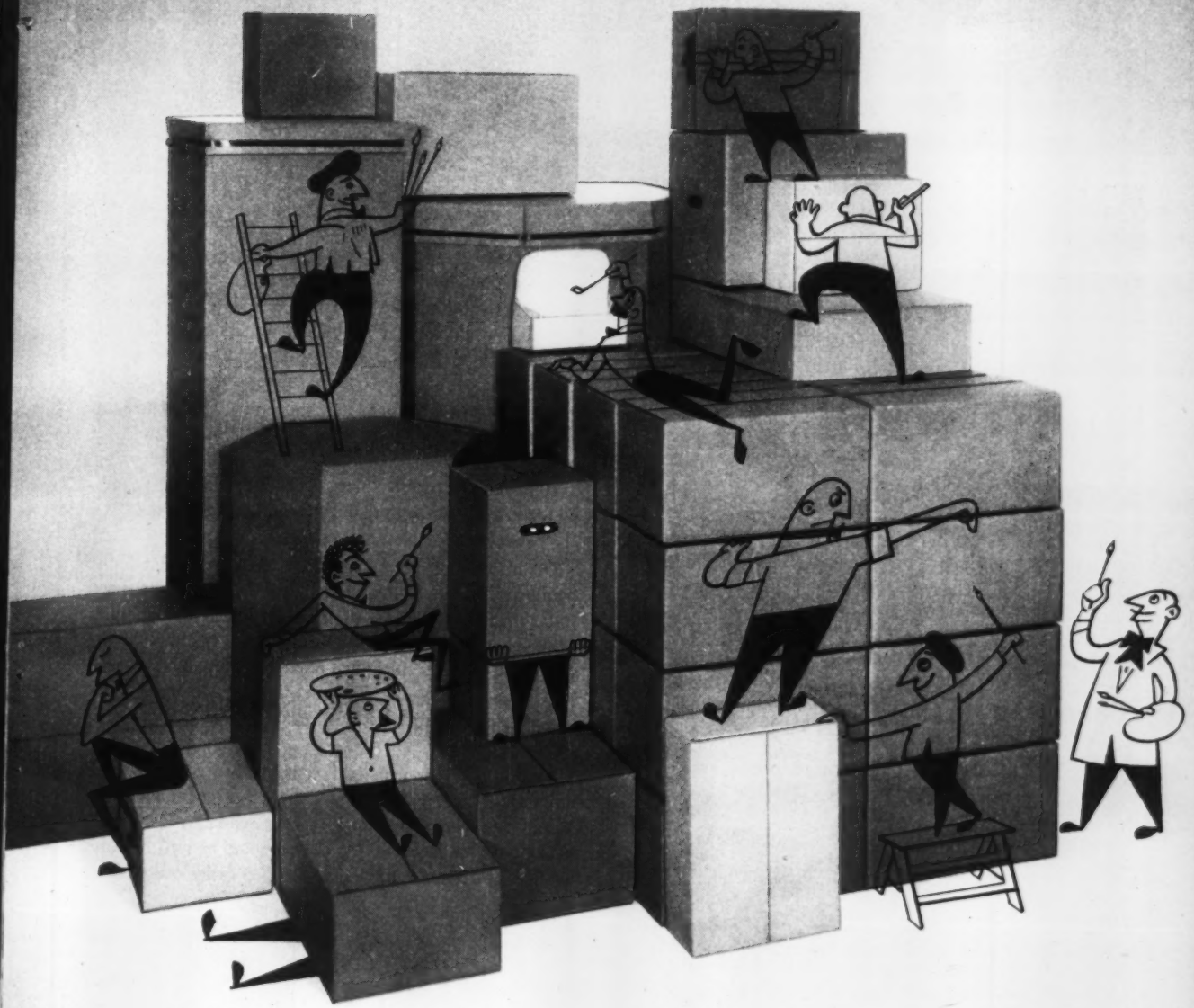
Pull more attention, push more sales with striking Gaylord design and printing on your corrugated boxes. Our creative artists know how to give your product a promotional advantage.

For corrugated boxes that leave lasting sales impressions . . . or for engineered packaging . . . call your G-Man.* It costs no more.

*Your Gaylord Man—of course.



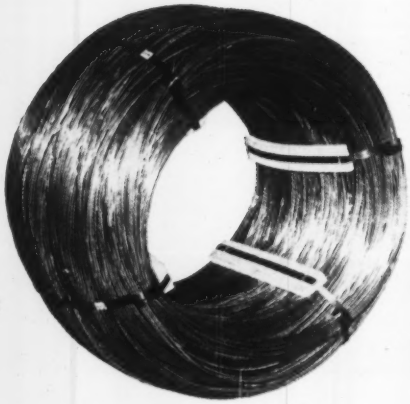
GAYLORD CONTAINER CORPORATION

Gaylord Boxes

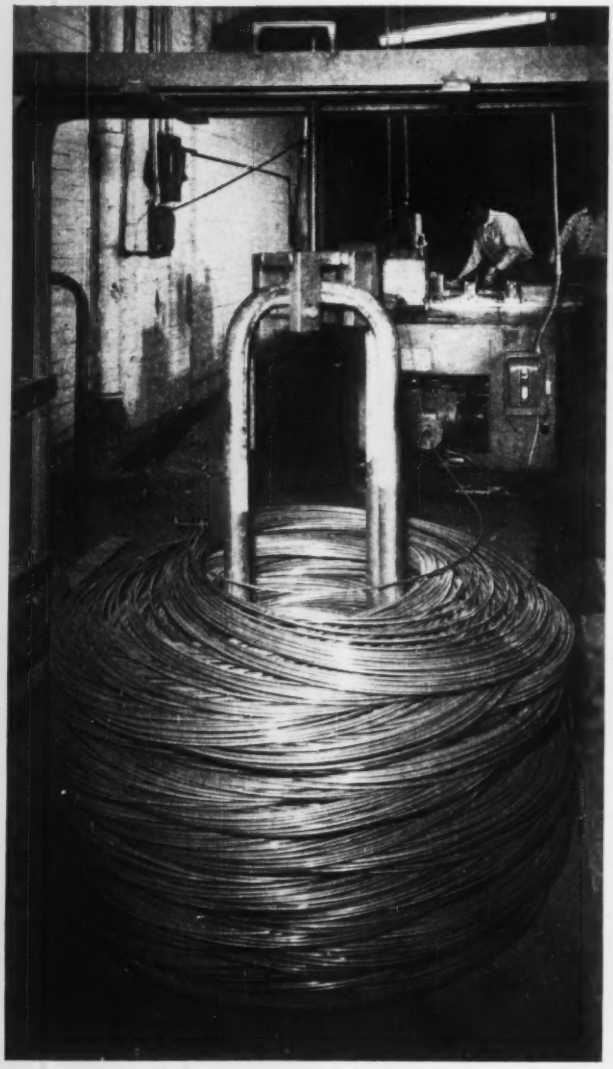
HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**

CF&I WIRE HELPS PACKAGED for YOUR PRODUCTION



Compact shaped coil ready for shipment



"CF&I shaped coils have saved us 25% in storage, 20% in downtime, have increased our production by over 20%, and have enabled us to produce a higher quality product."—said Mr. Sol Lipshitz, president of Reforce Steel and Wire Corp., Brooklyn, New York.

Problem: "Previously with small coils, we had to stop our machine every 25 minutes to butt-weld the end of a new coil to the used-up coil. As we had to go to this trouble twenty times a day, we were losing 1½ to 2 hours daily in downtime," explained Mr. Lipshitz.

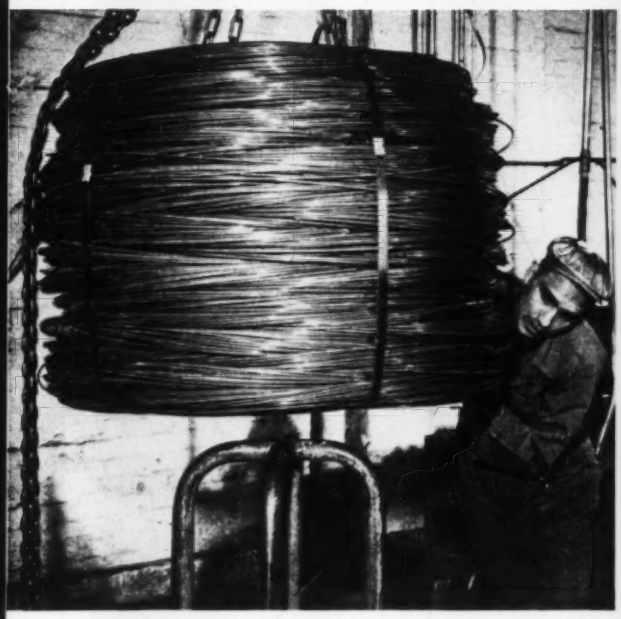
Solution: "A CF&I salesman carefully examined our operation; then he suggested that we use CF&I shaped coils which hold 2500 pounds of continuous length wire, as opposed to 200 or 300 pounds. As a result, we now stop our machine only once to start a new coil, instead of 10 times every day. We save nearly two hours, and have increased production by 20%.

"In addition, CF&I shaped coils have greatly reduced unloading time. Now when we receive a truckload of wire, we unload and store 15 pieces instead of 200. This not only saves time, but freight expenses as well because we now store much more and have to order one-fifth as often."

CF&I heavy coil mounted on spider for pay-off. This heavy coil contains 2500 pounds of continuous length of wire—enough wire for one-half day's production at the Reforce Steel and Wire Corp. "By virtually eliminating downtime with these heavy coils, we have increased production by 20%," said Reforce's president.

CUT DOWNTIME 20%

at Reforce Steel and Wire Corporation, Brooklyn, N. Y.



Heavy coils are quickly and easily placed on a revolving spider. The spider, which is leased from Wickwire, acts like a spool and assures smooth, even pay-off. "Because our machine jerks rather than drawing steadily, the small coils frequently pulled over and became tangled," explained Mr. Lipshitz. "CF&I heavy coils on spiders give us a steady flow of wire and make our operation more uniform."

Here you see some of Reforce's finished reinforcing accessories. "CF&I heavy coils have increased the quality of our product," said Mr. Lipshitz. "Small coils require frequent coil end welding. Sometimes, due to different coil melting temperatures, our automatic welding machine failed to make a good bond, forcing us to re-weld some faulty joints. CF&I long length coils have eliminated this problem."

Choose the CF&I wire package that offers one or more of the following benefits for your production:

- **less downtime with extra-long lengths of wire**
- **quick unloading and easy in-plant handling**
- **simplified inventory control**
- **assured cleanliness of the wire**

Our salesman will be glad to study your operation and recommend the wire package that will save you time and money. Call the nearest CF&I office today to set up a "no obligation" appointment.

CF&I-WICKWIRE WIRE

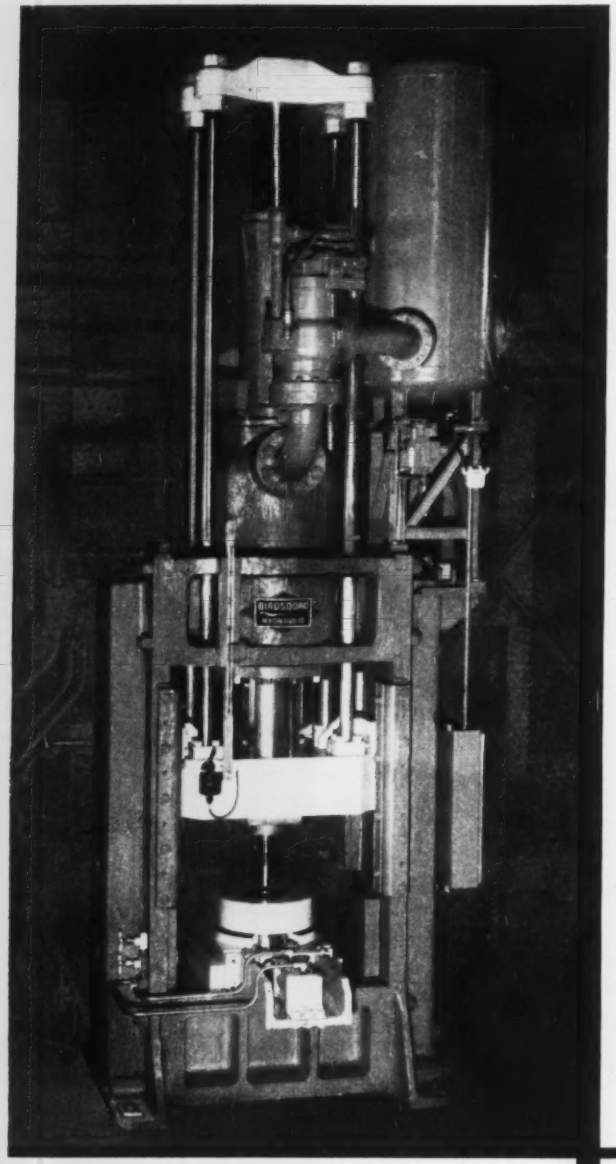
THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa (Tex.) • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg 6946



forging/extruding research press by BIRDSBORO

• This 500-ton combination forging and extruding oil-hydraulic press is designed to help a leading steel producer study the behavior of new metals in its research center. The unusual flexibility of the press design makes it ideal for experimental work. All operations can be performed under manual or automatic control. Though many of the metals studied are unpredictable, one thing is certain . . . top performance from the Birdsboro press. You can learn more of the reasons why from your nearest Birdsboro representative, or: *Sales Department:* Reading, Pa., *Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

HP.-36-58

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STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

PERFORMANCE DATA:

- *Forging—Over fifty 1" strokes per minute on planishing cycle*
- *Extrusion—15" to 150" per minute speed remotely controlled*
- *Interlocked hydraulic-electric circuit provides unusual flexibility*
- *Selector switch permits rapid operating changeover*
- *Designed for manual and semi-automatic forging and manual planishing*
- *Extruding is arranged for automatic sequence operation. Shear is built into tooling.*
- *Press can be utilized for production*

BIRDSBORO HYDRAULIC

Hats off to the profit makers!

Maintenance departments are major profit makers. Here's why:

A 10% reduction in maintenance costs can result in a *4% jump in profits in the average plant*—according to latest Commerce Department figures.

Increasing numbers of cost-conscious maintenance men are adopting Organized Lubrication as one of the proven ways to reduce costs. As Texaco Lubrication Engineers have demonstrated time and again, an Organized Lubrication program can *cut direct maintenance costs as much as 10%!* (Other benefits: more dependable production, reduced lube inventory, simplified purchasing.)

Managers throughout the U.S. who have installed and evaluated Organized Lubrication programs can testify to the profit gained.

Texaco Lubrication Engineers can offer help and helpful material to start an Organized Lubrication program in your plant. Why don't you look into it? Call our expert—or write for a copy of our book: "Organized Lubrication . . . Major Cost Control Factor."

☆ ☆ ☆

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. **S-130.**

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

ONE important feature of automatic production is **the storage of shape in dies.** This is also the basis of closed die forging—"drop forging". **Chambersburg,** pioneer builder of equipment for making drop forgings, today builds tools that will shape forgeable materials to close tolerances by a combination of carefully designed die configurations, with precisely controlled forging blows and a fixed pattern of mechanized stock manipulation. When used with complementary shearing, heating, and trimming equipment, **fully automatic or semi-automatic production lines** are created which are capable of **increased output at lower costs.**

CHAMBERSBURG ENGINEERING CO.
CHAMBERSBURG • PENNSYLVANIA

A new publication, "The Automatic Production of Forgings in Closed Dies" provides the latest information on how to adapt these new developments to your drop forging operations. Write today for Bulletin 87-L-9.

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Designers and Manufacturers of
THE IMPACTER

Spherical

ROLLER BEARINGS BY LINK-BELT IN CAST STEEL HOUSINGS

THESE ROLLER BEARING PILLOW BLOCKS have spherical roller bearings with internationally standardized boundary dimensions.

The best features of modern bearing design... combined and refined

MAXIMUM SIZE ROLLERS

HIGH, HEAVY INNER RACE FLANGES

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More than a match for the toughest bearing applications! Link-Belt "MILL BEARINGS" combine industry's finest spherical roller bearings and super-rugged cast steel housings . . . the ideal combination for applications where severe shock loads are encountered.

Two types of shaft mountings facilitate installation . . . adapter mounting for commercial shafting and direct shaft mounting for shafting ground to recommended tolerances. And to assure top performance throughout their long life, these blocks can be furnished with Link-Belt's rugged, multi-labyrinth steel or dacron-contact seals to lock out dirt, lock in lubricant.

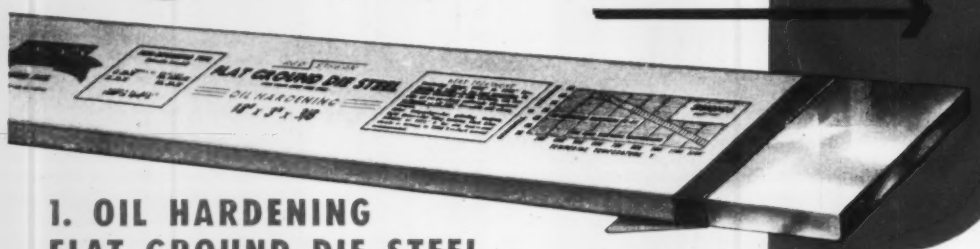
Get the full story from your Link-Belt office or authorized stock-carrying distributor . . . ask for new 52-page Book 2760. See BEARINGS in the yellow pages for phone listing.

LINK-BELT

SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,162

SIMONDS gives you all 3



1. OIL HARDENING FLAT GROUND DIE STEEL

Simonds quality-controlled tool steel . . . precision ground . . . ready-to-use . . . comes in 1001 stock sizes for 1001 uses: punches, dies, machine parts, small tools, etc. Spheroidize-annealed for best machinability. 18" and 36" lengths . . . flats and squares . . . individually packaged. A.I.S.I. or S.A.E. Type No. O1. *Chemical Analysis:* C .85-.95, Mn 1.00-1.25, Si .20-.40, Cr .40-.60, W .40-.60, V .10-.20.

2. AIR HARDENING FLAT GROUND DIE STEEL

This 5% chrome, spheroidize-annealed tool steel has exceptional wear-resistant qualities yet is easy to machine and heat treat. Ground to accurate dimensions . . . suitable for a multiplicity of uses . . . individually packaged in a wide range of stock sizes . . . flats and squares . . . standard 36" lengths (18" lengths also furnished, if desired). A.I.S.I. or S.A.E. Type No. A2. *Chemical Analysis:* C .95-1.05, Cr 5.00-5.50, Si .30-.50, Mn .50-.70, Mo .90-1.10, V .20-.30

3. and the NEW LOW CARBON FLAT GROUND STEEL

Here's a fine-grained, forging quality, silicon-killed steel that offers important savings on jigs, fixtures, patterns, stripper plates, punch pads, die plates, die-blocking shims . . . and parts that don't require heat treatment, or in some cases just case-hardening. This new line of low-cost steel rounds out the Simonds line of Flat Ground Steel, has equally fine finish, with excellent welding quality and machinability. Furnished in a wide range of flats from 1/16" to 1 1/2" thick and 1/2" to 16" wide, and in squares from 3/8" to 2 7/8". All sizes come in standard, ready-to-use 24" lengths, individually packaged. *Typical Chemical Analysis:* C .18, Mn .50, Si .20, S .04, P .04

GET FULL DETAILS PROMPT DELIVERY OF ALL 3 TYPES FROM YOUR SIMONDS DISTRIBUTOR

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why make parts the slow, costly way?

COLD-HEAD THEM!

Steel

Tappet plunger, splined square-head shaft, collar for adjustment wedge, universal joint bearing cup, pipe plug, spark plug body.

Copper

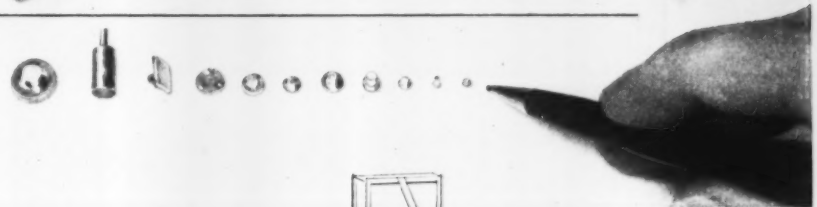
Ornamental stud, distributor cap center insert, commutator bar, wire clamp, solenoid contact, starter field terminal.

Aluminum

Hollow rivet, blind rivet, flanged collar, link, distributor cap outside insert.

Precious Metals

Electrical contact, transistor case, miscellaneous rivets and electrical contacts.



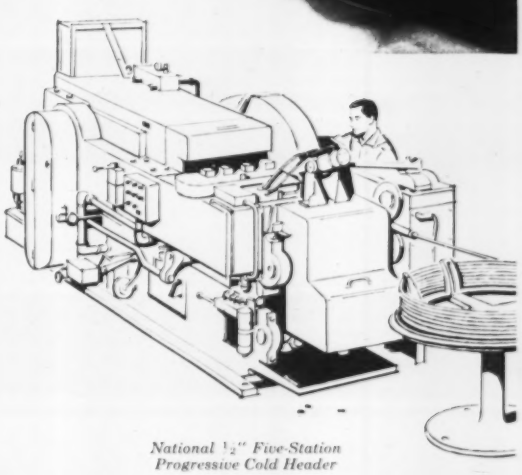
Of various metals, the parts identified above were developed for fast, accurate production on National Cold Headers.

Most of these important jobs are made without waste, ready for end use. All are cold-forged from coiled wire – start-to-finish in one compact Header – without any intermediate steps.

New technical break-throughs are making jobs like the above every day commercial realities. More workable wire, better lubricants, improved die materials and vast engineering experience are combining to adapt formerly difficult work to modern, profitable methods.

Whether you now have Headers or not, send us prints or samples of your jobs, or bring them to Tiffin where more of our people can help with *your* problem.

Perhaps up-to-date Cold Heading, a truly fast-growing process in metalworking, can pay off for you.



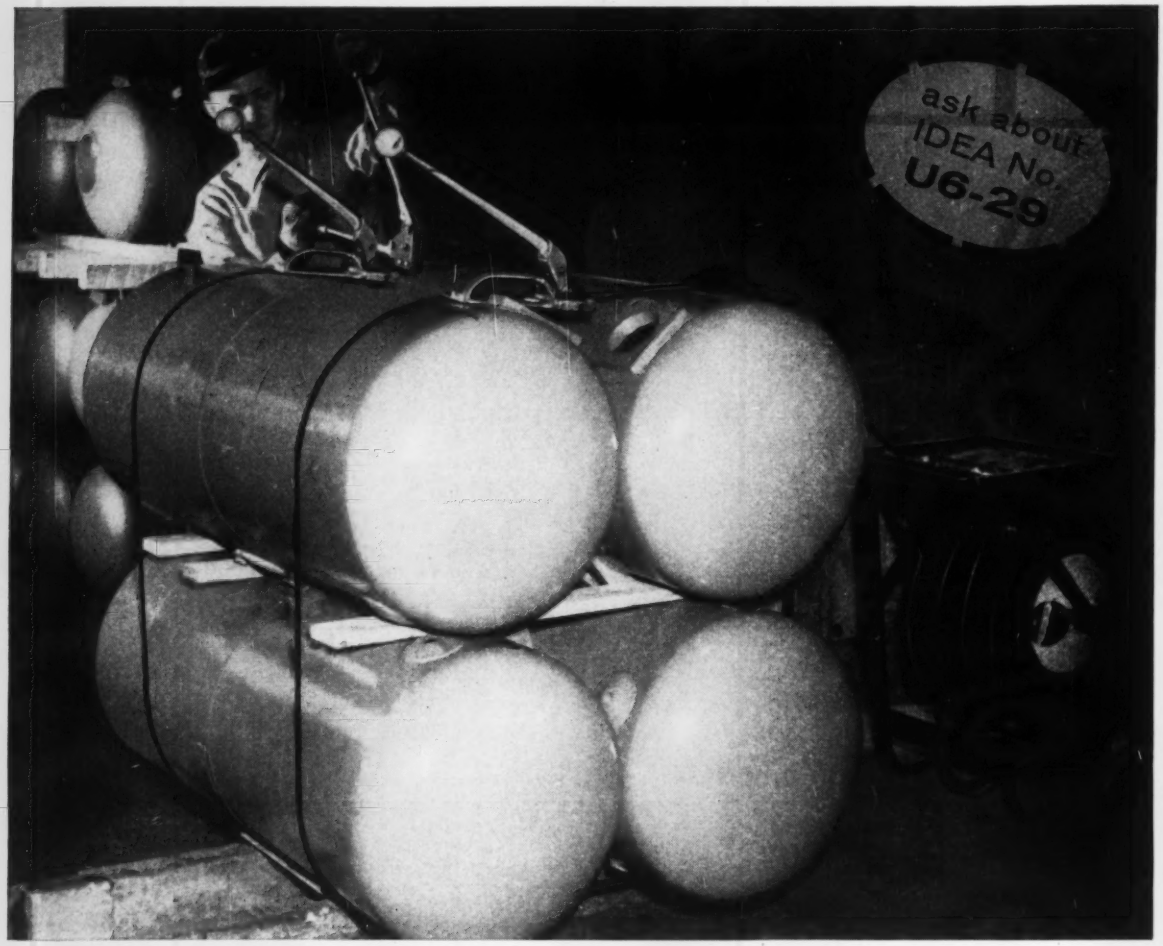
National ½" Five-Station Progressive Cold Header

Founded 1874 — DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS

NATIONAL MACHINERY CO.

TIFFIN, OHIO, U. S. A.

HARTFORD DETROIT CHICAGO



Use your AIM* . . . Pressed Steel Tank Co. does . . .

Unitizing reduces tank damage 75%

PRESSED STEEL TANK COMPANY, MILWAUKEE, WISCONSIN, cut damage claims 75% by using heavy-duty Acme Steel Strapping to unitize steel tanks. Working with their Acme Idea Man, a system was developed to strap tanks in units of four for fast handling and safe shipment. (Idea U6-29)

Acme Idea Man E. O. Schroeder worked with Pressed Steel Tank Company to devise unitizing methods.

Unitizing protects tank finish and prevents damage to exterior fittings. Tanks are held securely in position during shipment. This unitizing method also increases plant efficiency: although a strapping crew has been added, overall handling costs are less. Now the unitized tanks are handled entirely with mechanical equipment. Inventory control is simplified and storage space is more efficiently utilized. Customers appreciate improved arrival condition, too!

***Use your Acme Idea Man.** Problem solving in product handling and shipping is his business. Call him at the nearest Acme Steel office. Or write Dept. SDU-119, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

As he cuts off steel... he adds the "Touch of Gold"

The cut-off wheel this man is using is one of the complete Norton line, developed to bring the value-adding "Touch of Gold" to all cutting-off jobs, on all metals and the widest variety of nonmetallic materials.

For wet or dry cutting, on manual or automatic machines, Norton cut-off wheels are available in ALUNDUM* aluminum oxide and CRYSTOLON* silicon carbide abrasives . . . in resinoid, rubber and shellac bonds . . . with or without reinforcement of glass cloth, nylon, cotton or combinations of these.

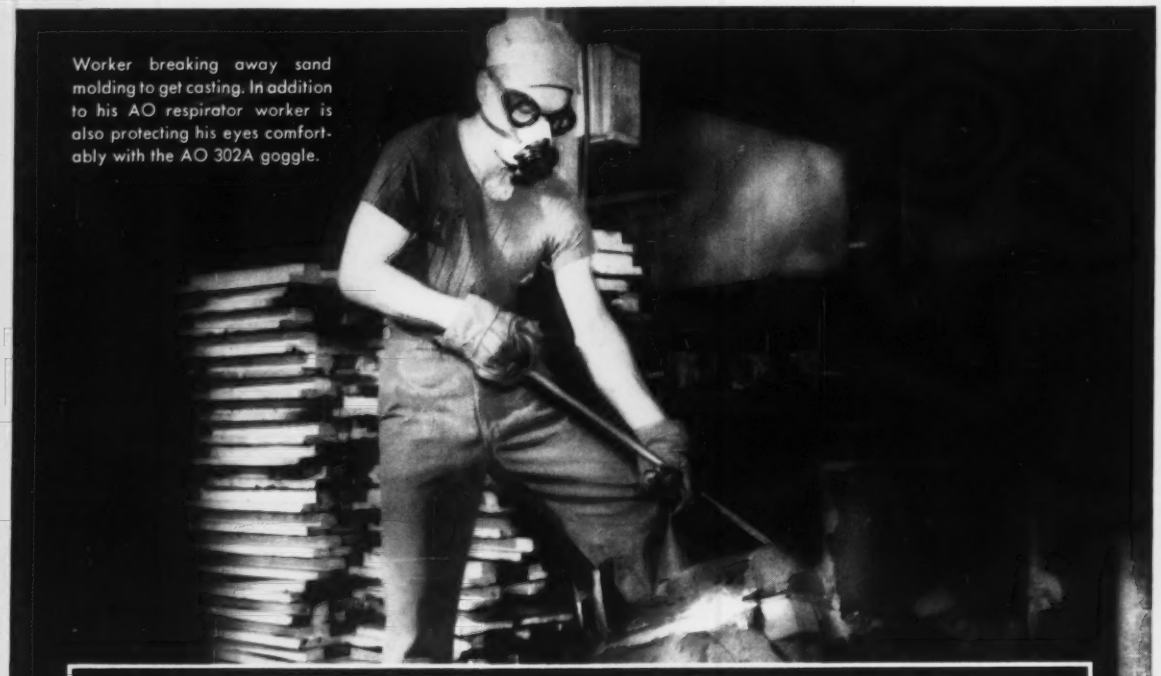
Backed by leadership in abrasive product development, Norton cut-off wheels are recognized as the most efficient, most economical production tools of their type. Your Norton Man, a trained Abrasive Engineer, and your Norton Distributor will be glad to tell you how these "Touch of Gold" benefits can be brought to your own production. NORTON COMPANY, General Offices, Worcester 6, Mass.

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes



Worker breaking away sand molding to get casting. In addition to his AO respirator worker is also protecting his eyes comfortably with the AO 302A goggle.

POSITIVE PROTECTION

on Foundry Shakeout and Many Other Operations

AO R2090 RESPIRATOR

1 FACE PIECE—QUICKLY INTERCHANGEABLE CARTRIDGES

Here's Bureau of Mines approved respiratory protection for all dusts not significantly more toxic than lead, pneumoconiosis-producing mists and chromic acid mists. The AO R2090 Respirator can be easily converted to any of eight other respirators. The retainer shell accommodates five chemical cartridges, three reusable dust filters and the R90 "Red Devil" filter.

The R2090 has extremely high filtering efficiency and the built-in pre-filter assures very long service life. The revolutionary variable density filter is compact and lightweight — 3″ in dia., 1/5″ thick, weight only 1/300 of an oz. Your nearest AO Safety Products Representative can supply you. Or write for new bulletin S-9034 describing the AO R-2000 series, respirators, cartridges, filters.

Photo courtesy of Draper Corp., Hopedale, Mass.

American Optical
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SOUTHBRIDGE, MASSACHUSETTS
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Always insist on AO Trademarked lenses and frames

KEYSTONE and Yellow Strand®

working together for 30 years to maintain wire rope leadership —

For more than three decades, Keystone has worked closely with Broderick & Bascom Rope Co., St. Louis, Mo., to produce superior quality wire that meets the ever-changing demands of the wire rope industry.

A good example is the large 3⅛" Yellow Strand "Powersteel" Dragline Rope with a breaking strength of 448 tons. This strong, abrasion-resistant, high-carbon steel wire rope was developed to match the increased capacity, power and speed of today's giant draglines and strip mining equipment.

Sharply contrasting to the big rope is the 1/32", 1 x 7 Galvanized Aircraft Strand—also illustrated—one of the smallest B & B wire ropes.

Keystone and B & B engineers together have developed unusual manufacturing methods to produce a wire rope with superior performance.

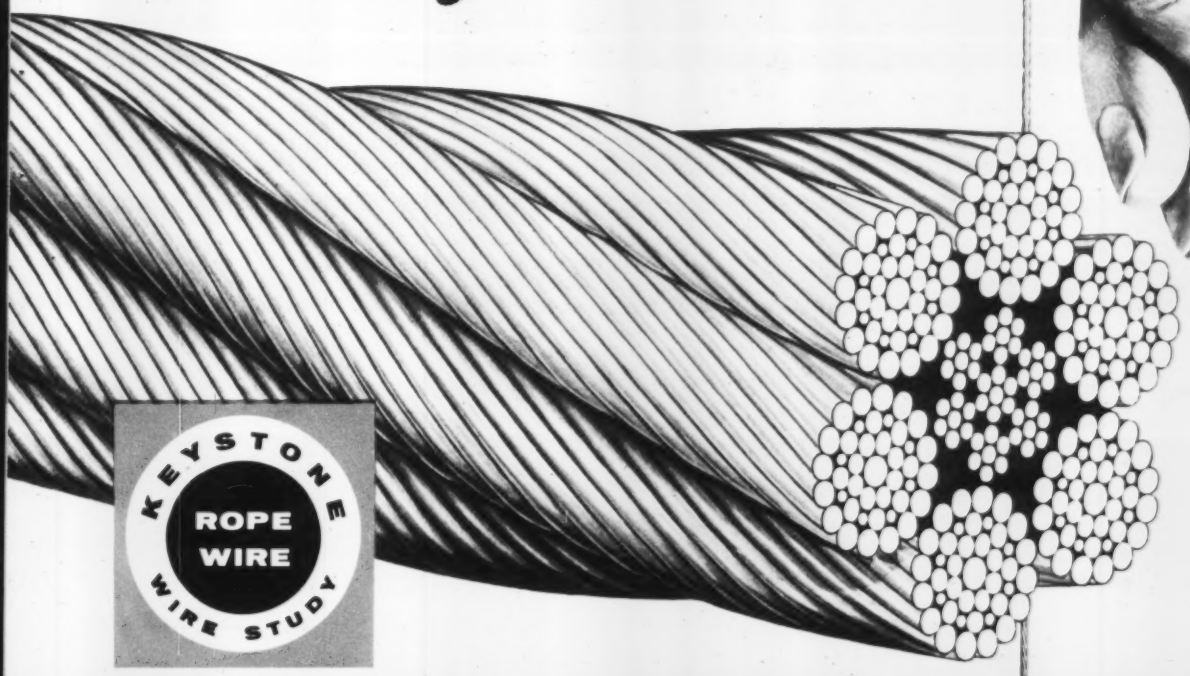
You, too, can enjoy these sales advantages and create customer demand by specifying Keystone Wire wherever wire is used in your products. Call your Keystone representative!

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY

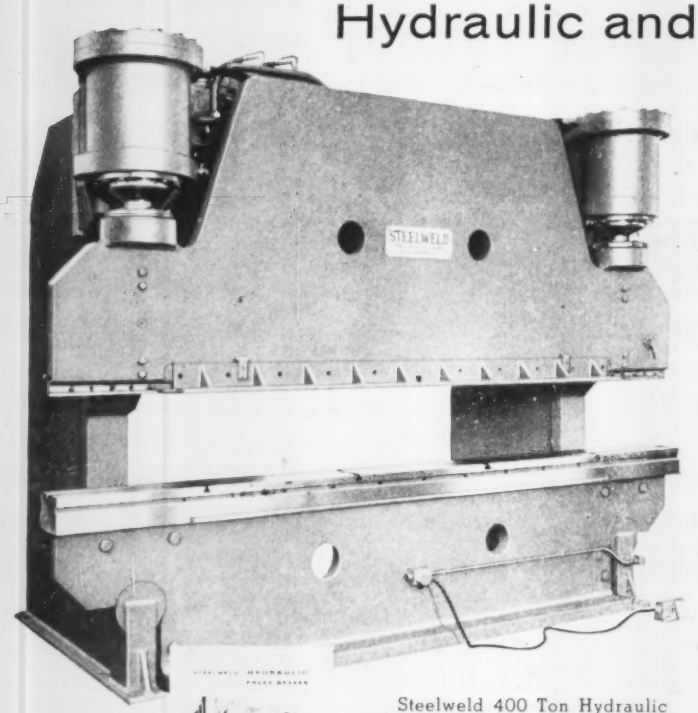
The large wire rope consists of 295 individual wires, laid up into 6 strands of 41 wires each with Independent Wire Rope Core. The small, galvanized aircraft strand is made up of 7 wires.



KEYSTONE ROPE WIRE STUDY

STEELWELD PRESS BRAKES

Hydraulic and Mechanical



Steelweld 400 Ton Hydraulic Press Brake. Bed and ram length 14'-0".

Steelweld 320 Ton Mechanical Press Brake. Bed and ram length 12'-2".

WHATEVER your requirements, there is a Steelweld Press Brake — hydraulic or mechanical — to best serve your needs. Available in all sizes to 2000 tons. For plate thicknesses to 2". For lengths to 30'-0".

Each type of machine, mechanical or hydraulic, has its particular advantages. The work to be performed is the determining factor for most satisfactory machine selection.

As a manufacturer of both types of press brakes, we are in a position to offer you either one without partiality. Therefore, we urge you to get the complete story, the Steelweld story, when considering the purchase of a new brake. Ask for free catalogs.

Hydraulic Press Brakes
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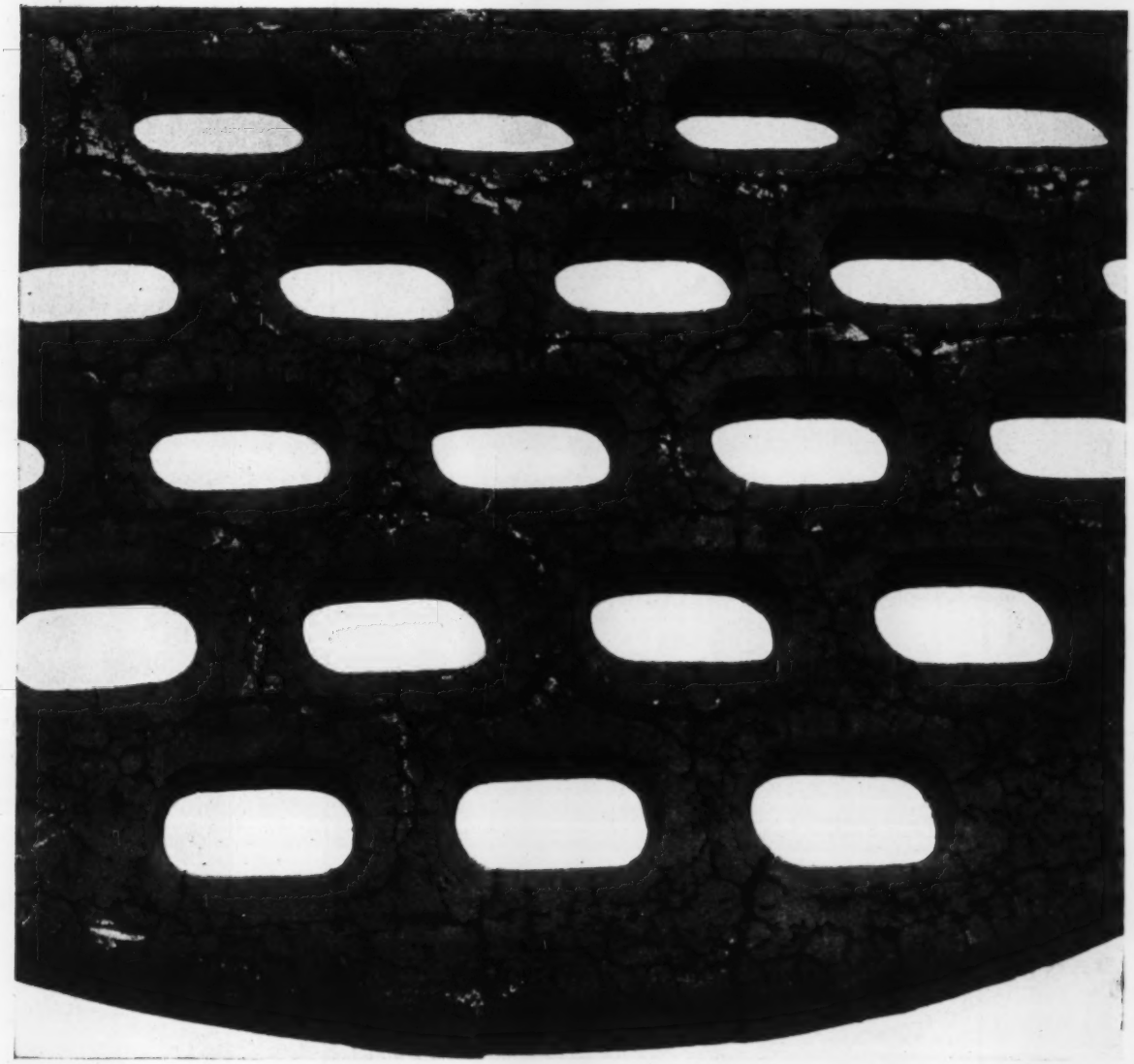
Mechanical and Hydraulic
PRESS BRAKES

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

THE CLEVELAND CRANE & ENGINEERING CO. • 7875 EAST 281st STREET • WICKLIFFE, OHIO



This is THERMAL FATIGUE

This photograph shows a heat-resistant alloy casting after thermal-fatigue failure.

Thermal fatigue begins with cyclical heating and cooling which produces alternate expansion and contraction. The shape of the casting hinders this expansion and contraction. As a result, hindered expansion and contraction stresses develop and increase until plastic flow occurs. This plastic flow produces a network of thermal-fatigue cracks and this cracking leads to failure.

Thermal fatigue is an inherent problem in heat-resistant castings. As such, it occupies an important place in Electro-Alloys research efforts to lengthen life of components working under high temperatures and severe cyclical conditions.

We have created apparatus that assesses and analyzes the variables of thermal fatigue. Check with your Electro-Alloys representative for the meaning of our thermal fatigue data as it pertains to the material, design and service conditions of your heat-resistant castings.

Send for free technical booklet on Thermal Fatigue

Please send me free copy of "The Mechanism of Thermal Fatigue," by Howard S. Avery comprehensive report based on extensive lab studies:

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Electro-Alloys, 10211 Taylor St., Elyria, Ohio

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION • Elyria, Ohio

Machine Tool Buyers:

Beware the fallacy of the "Rate of Return on Investment" formula

Many capital goods replacement decisions are based on a formula known as "rate of return on investment".

The following example underscores the risk of management's arbitrary selection of a "desired" return.

Hypothesis

(1) Management Objective — 15% Return
(2) Cost of New Equipment — $100,000
(3) Savings Now — $10,000 Per Year (10%)
(4) Projected Increase in Savings Each Year — $1,000

Decision

Postpone Replacement for 6 Years when savings of $15,000 will be attained.

Result

Avoidable Costs Incurred: First Year — $10,000; Then $1,000 More Each Year — A total of $75,000 After 6 Years.

Secondary Result

Projected Cost of Equipment in 6 Years — $145,700. Postpone Replacement for 6 More Years. *Ad Infinitum.*

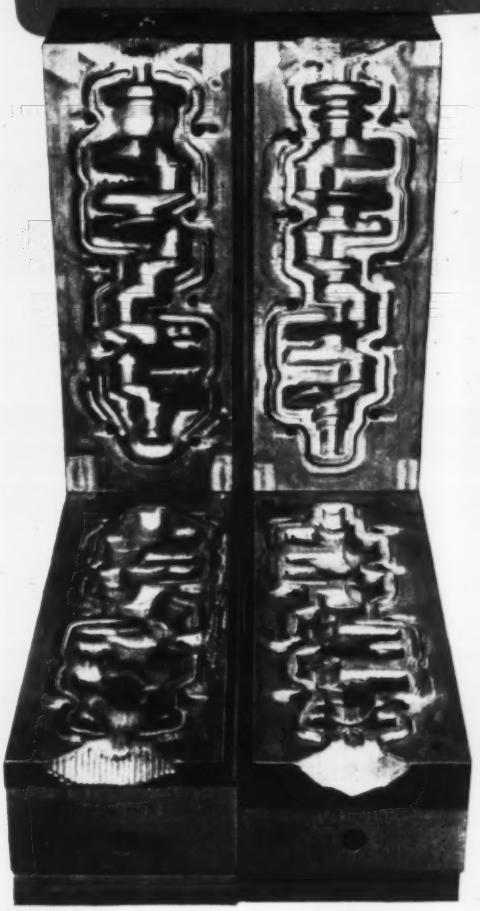
Does Jones & Lamson offer a positive approach; a realistic, workable formula that is free from fallacies such as this? *Yes!* Write today for complete information.

the man who needs a new machine tool is already paying for it

JONES & LAMSON Machine Company, 517 Clinton St., Springfield, Vt.

Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

Finkl die blocks and forgings made of vacuum degassed steel*



*

REDUCE DOWNTIME

Finkl vacuum degassed steels result in die blocks, hot work die steels, and forgings with greater ductility and toughness. This means that size for size, and/or hardness for hardness, the degassed steel reduces the chances of breakage and excessive wear under severe operating conditions.

*

REDUCE MACHINING TIME

Finkl vacuum degassed steels are cleaner. About 50% of the nonmetallic inclusions have been removed. Machineability is improved, with higher lusters obtainable in die block impressions, if desired. Fewer tool regrinds are required.

*

ASSURE DELIVERY

Finkl vacuum degassed steels promote high density centers in large die blocks and forgings therefore reducing the possibility of late shipment because of ultrasonic rejection.

DIE BLOCKS · FORGINGS · HOT WORK STEELS · ELECTRIC FURNACE STEELS · F

For over 80 years Finkl has been producing top quality products. Now with the introduction of vacuum degassing of our electric furnace steels we have the most complete control of quality which enables us to offer the finest in die blocks, hot work die steels and flat die forgings. Call your Finkl representative.

A. Finkl & Sons Co.

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Your new plant or expansion idea

Raw materials available?

Right process chosen?

Location correct?

Capacity adequate?

Economically sound?

Readily financed?

Kaiser Engineers designs and builds major facilities for the Steel industry, and is U. S. licensor for the proven L-D Process of oxygen steel making.

Among KE's most valued services are sound, searching economic analyses, feasibility studies and site evaluations. In a word—*Pre-Engineering*—impartial, outside analysis which helps you decide whether to proceed with, defer, or modify the project.

Kaiser Engineers offers you cost-saving, time-saving, one-company service from concept through start-up.

KAISER ENGINEERS

Division of Henry J. Kaiser Company
Oakland 12, California
Pittsburgh, Washington, D. C., Chicago, New York

• KE projects include work in Argentina, Australia, Brazil, Formosa, Japan, New Zealand, as well as Canada and the United States. Assignments range from preliminary planning to plant construction.

5459

THE ONES THAT WILL LAST (and last, and last!)? THOSE MADE FROM CONTINUOUS PROCESS ZINC-COATED STEEL SHEETS

And just why will they last and last?

The people of the Galvanized Container Industry, always alert to make improvements to keep their products the best, can give you a multitude of reasons why. Chief among them: the continuous process insures a uniformly applied, corrosion-resistant zinc-coating. In fact, the zinc and steel are integrated to form a tight bond for every square inch, a durable coating which stands up to any rigorous stress of the fabrication process.

Continuous process zinc-coating will not chip or flake, no matter how much it is twisted, crimped or lock seamed. It can be worked to the very limits of the steel itself! Your budget benefits because there is no need for additional coating of any kind.

In continuous process zinc-coated steel, there is a stand-out—Weirkote. On your production lines and in your products, Weirkote will work for you all of the time. For detailed information on the many advantages of Weirkote zinc-coated steel, write today for a brochure. Weirton Steel Company, Dept. B-19, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

INTRODUCING AN ALL ELECTRIC, VARIABLE SPEED DRIVE FOR UNDER $220.* THE FRACTIONAL hp. V★S Jr.

Now you can gain the efficiency of stepless speed changes for smaller machines. The new fractional V★S Jr. puts complete machine control at your operator's fingertips, for less than $220.*

The fractional V★S Jr. will vary drive motors speeds from 215 thru 1725 rpm. Speeds can be changed through this 8:1 range by a simple turn of the selector dial. Speed changes can be made while the machine is operating or pre-selected before starting.

This packaged drive provides start, stop and stepless speed changes from in-plant a-c. power. Jog, reverse, and braking functions are available for more flexibility. The fractional V★S Jr. is available from ⅛ thru ¾ hp. in all enclosures with standard or gearmotor, and is a new addition to the integral V★S Jr. line, 1 thru 4 hp.

*⅛ hp. drive complete with motor, controls, and operators panel.

For complete details contact your local Reliance representative or write today for this new illustrated bulletin D-2507.

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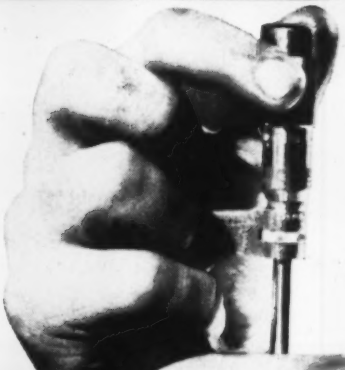
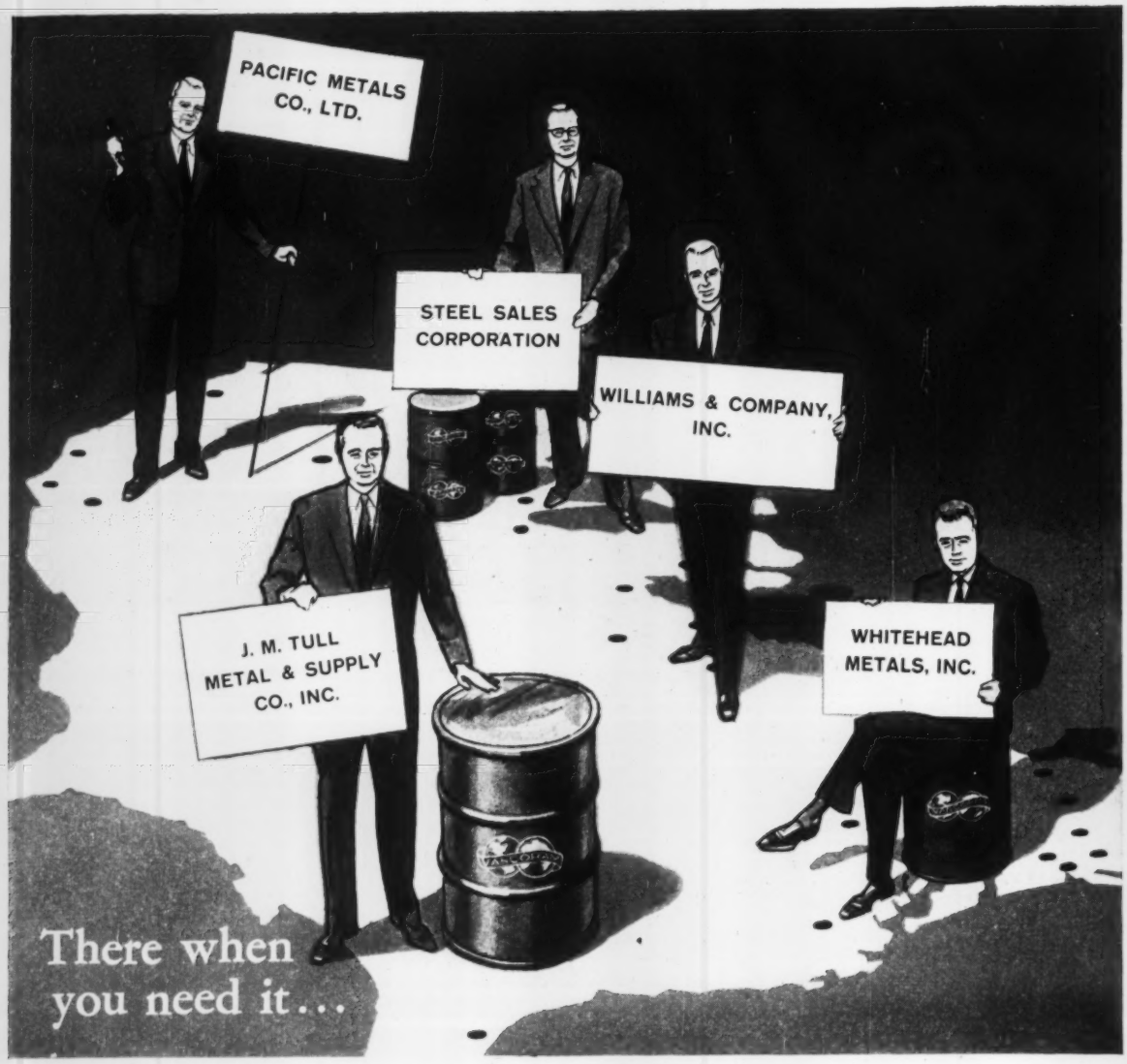


He's looking at it through *your* eyes . . . yes, he's *your man*, when he checks the dimensions of Bristol Brass sheet, rod, or wire against your original specifications. And when he says: "*On the nose*" . . . then that's *it*. There are a lot of men like this . . . in fact, *all* of them are like this . . . ready to work for you at: The BRISTOL BRASS CORPORATION, since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut. Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse *and for brass forgings, too* . . . Accurate Brass Corp. (Subsidiary of The Bristol Brass Corp.), Bristol, Connecticut.

"Bristol-Fashion" means Brass at its Best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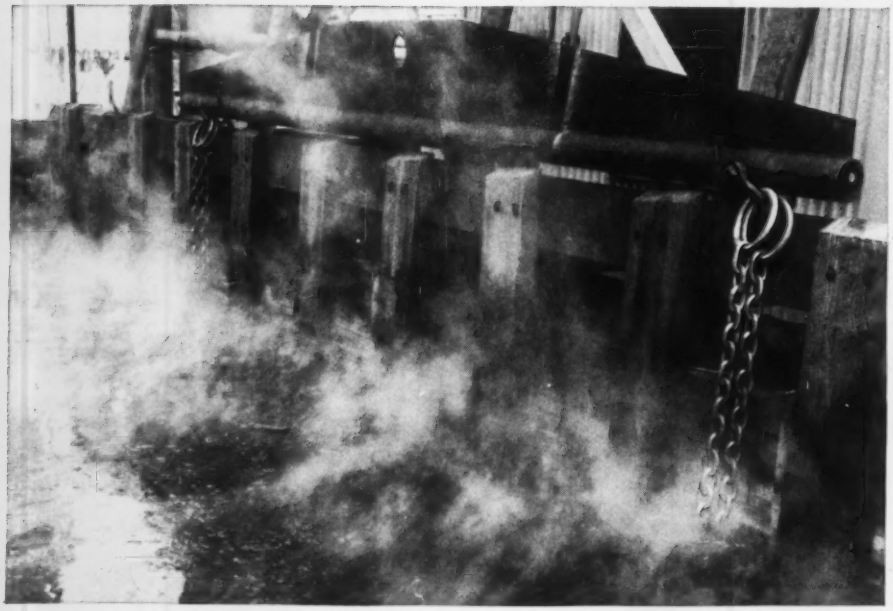

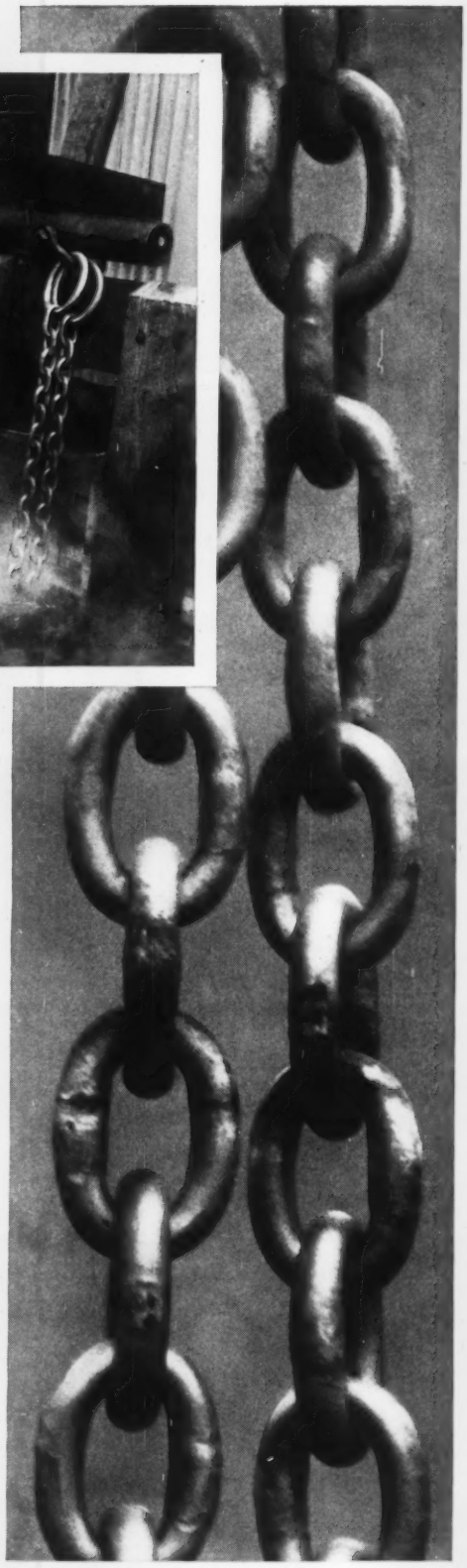

7 years on the pickling line Monel chains still have no "weak link"

They resist corrosion, retain high strength, ductility

Take a closer look at these ⅝-inch chains of Monel* nickel-copper alloy.

You'd never know that they've been handling two-ton loads five days a week, for seven years in a 5% sulfuric acid pickling solution at Hammond Iron Works, Bristol, Pennsylvania.

They look as good as new . . . have seven years pickling service behind them, *years of service ahead!*

Monel alloy a natural for pickling equipment

Exceptional corrosion resistance...high strength and ductility that lasts...these are the principal reasons why Monel alloy is a natural for pickling chains...for pickling hooks, slings, tie-rods and baskets, too.

Add up these advantages

1. The high strength of Monel alloy permits you to use lighter equipment to carry greater loads. It's the strongest nonferrous metal you can use.

2. No need to allow for extra metal to offset corrosion. Monel alloy withstands sulfuric acid pickling solutions . . . outlasts other materials many times.

3. Equipment of Monel alloy is easily fabricated, easily repaired.

Get complete information

You'll find details about Monel pickling equipment in a 32-page booklet "Equipping the Pickle House for Greater Production at Lower Cost". For your copy, just write.

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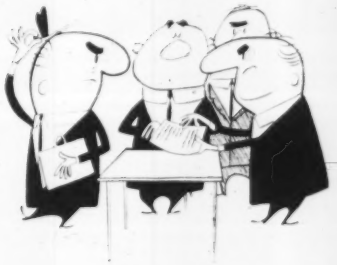
MONEL®

How Steel Case Affects Other Labor Talks



You can see at least three trends in metalworking labor negotiations that are growing out of the steel case: 1. Many settlements are being deferred until both sides study the results in steel. 2. Management is taking a stronger stand against pay for unnecessary work. 3. The tougher management attitude is putting union heads in a balky mood (Page 105).

Steel Industry Losses in Third Quarter Exceed $107 Million

Twelve steel companies that have been strike-idled since July 15 have issued third quarter financial statements so far. Their combined net losses: $107,715,683. During 1958's third quarter, the same 12 earned $135,022,998. Figures for 17 steelmakers are listed in STEEL, Nov. 2, p. 38. Here are others: Jones & Laughlin Steel Corp.: $16,465,000 net loss in '59's third period vs. $18,141,000 net profit in '58's third period; Inland Steel Co.: $7,499,109 loss vs. $12,118,009 profit; McLouth Steel Corp.: $3,193,566 loss vs. $2,766,781 profit; Crucible Steel Co. of America: $2,034,090 loss vs. $2,854,374 profit; Sharon Steel Corp.: $1,560,080 loss vs. $66,484 profit; Acme Steel Co.: $1,556,335 loss vs. $1,631,088 profit. Reports for two firms that operated during the quarter: Keystone Steel & Wire Co.: $1,813,565 vs. $1,523,270; Eastern Stainless Steel Corp.: $713,130 vs. $753,449. Universal-Cyclops Steel Corp., struck at two of its five plants, earned $361,553 vs. $1,087,108 in the year-earlier quarter.

Profit Sharing: Reuther Wants It; McDonald Doesn't

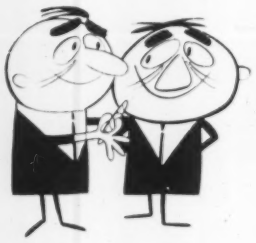
Look for Walter Reuther, UAW chief, to make a strong bid for a profit sharing plan when auto negotiations open in 1961. But don't expect David McDonald, USW chief, to seek such a program in the near future. Managers are also split on the issue: Some feel it's an effective tool for boosting productivity; others say it's not an equitable method of pay (Page 110).

Demand for Executives Keeps Climbing

Industry will need more than 5600 executives in the coming six months, says Executive Manpower Corp., New York. About 26 per cent of the positions will be in production. More than half the openings will be newly created posts. About 35 per cent of the companies surveyed by EMC pay execu-

tives a salary plus bonus; 19 per cent pay straight salary; 12 per cent offer a salary plus stock option.

It Pays to Aid Your Distributor



You can improve your profits by helping your distributors increase theirs. Some of the principles to adopt: 1. Put your sales policy in writing and publicize it well. 2. Give complete pricing information fast. 3. Allow adequate profit margins, but police any price fighting. 4. Be generous with sales and technical help. 5. Be fair but firm on credit. For other important tips, see Page 120.

Here's What Fringe Benefits Cost

The Employers Association of Detroit surveyed 74 firms in the Detroit metropolitan area and found these average costs for fringe benefits for hourly employees (in cents per manhour):

Supplemental Unemployment Benefits	4.633	Sickness, accident, or medical care	2.107
Vacation pay	14.607	Hospitalization insurance	6.161
Holiday pay	7.365	Recreation programs	0.322
Bonuses, profit sharing	8.252	Sick leave pay	4.048
Unemployment compensation	4.463	Rest periods	9.561
Pension plan	12.000	Wash-up time	4.301
Life insurance	2.485	Severance pay	3.357

Women Smash Industrial Barrier

Look for industry to accept women in managerial, technical, and skilled jobs to a much greater degree in the coming decade. Reason: Industry will be forced to rely more heavily on the lipstick set because of a shortage of manpower. More than 4 in 10 women between 18 and 65 are in the labor force today. Women, technicians, and oldsters can help you (Page 112).

Steel Shipment Stolen

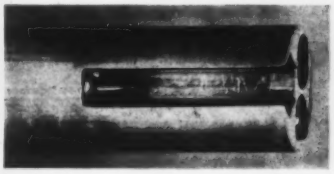
The first reported theft of a steel shipment since the start of the strike took place in Gary, Ind., Nov. 1. Two trucktrailers, loaded with 47,000 lb of coiled strip (value: $3400), were taken from the Consolidated Freight Co. terminal. They were en route to Ford Motor's stamping plant in Chicago Heights, Ill.

You—Employee and Employer—Face Tax Hike on Jan. 1

On Jan. 1, 1960, you'll assume a 0.5 per cent increase in Social Security taxes. As an employee, you'll pay 3 per cent instead of 2.5 of your earnings up to

$4800 annually. As an employer, you'll match the employee's contribution. If you're self-employed, you'll pay 4.5 per cent instead of 3.25 per cent. It'll boost your annual payments to $144 from $120.

Electrolytic Machining Expands Its Horizons



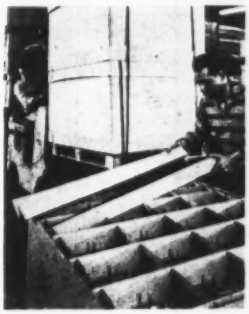
The cavity sinker, developed by Anocut Engineering Co., Chicago, is shattering geometric limitations for electrolytic machining. The new tool sinks cavities of any shape into metals that can hardly be touched with conventional techniques (Page 156).

Compare Your Wage Costs

Here are wage rates found by the Employers Association of Detroit's new Area Wage Survey. Covered are 62,673 hourly paid employees in 115 companies. Rates given are weighted averages; the first figure is for straight time coverage, the second for incentive rates:

Top grade assembler	$3.15	$3.05	Laborer	2.26	...
Medium grade assembler	2.53	2.66	Turret lathe (s & o)	2.74	3.63
Lower grade assembler	2.39	2.52	Turret lathe (operate)	2.49	2.78
Boring mill (set up and operate)	2.74	...	Power vehicle operator	2.37	3.11
Boring mill (operate only)	2.46	2.95	Die setter	2.67	...
Radial drill press (s & o)	2.63	3.03	Stock handler	2.38	2.90
Radial drill press (operate)	2.48	...	Tool crib attendant	2.51	...
External grinder (s & o)	2.66	3.50	Oiler	2.48	2.84
External grinder (operate)	2.49	2.27	Tool and diemaker (Class 1)	3.23	...
Janitor-sweeper	2.20	2.51	Spotwelder	2.42	2.78

What's New in Packaging



You might find it profitable to adopt a new packaging concept, called "modular panel packaging," being put to use by the Air Materiel Command. It employs re-usable standard panels instead of boxes for shipping. Its proponents claim substantial savings in warehouse space, labor, weight, and dunnage. Plastic bags and corrugated containers are becoming more prominent in metalworking's shipping areas too. And there's a trend toward employing packaging engineers (Page 108).

YS&T to Begin $60 Million Expansion After Strike

Youngstown Sheet & Tube Co. will begin work on five major projects at its Indiana Harbor Works as soon as it gets its mills rolling again. The $60 million program will include a 52 in., six stand, cold reducing mill which will roll steel for tin plate at 7250 fpm, a 300 ft extension of the ore dock,

and additional equipment for finishing seamless tubing. Completion is expected in 15 to 18 months.

Welding Helps Casters Trim Costs, Improve Quality

Look for more foundries to take advantage of welding in designing and fabricating their products. The compressor cases in the picture are made by welding plates to cast parts. Worthington Corp.'s John Mikulak tells why it's profitable (Page 170).

Project Will Upgrade Personnel Function

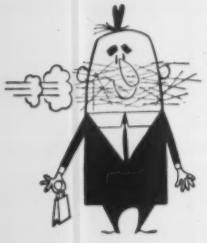
The American Society for Personnel Administration is working on a long term study involving: 1. Agreement on what constitutes a comprehensive personnel program. 2. Standardization of job titles in personnel administration. 3. Standards of acceptable performance. 4. Optimum types of training for personnel men.

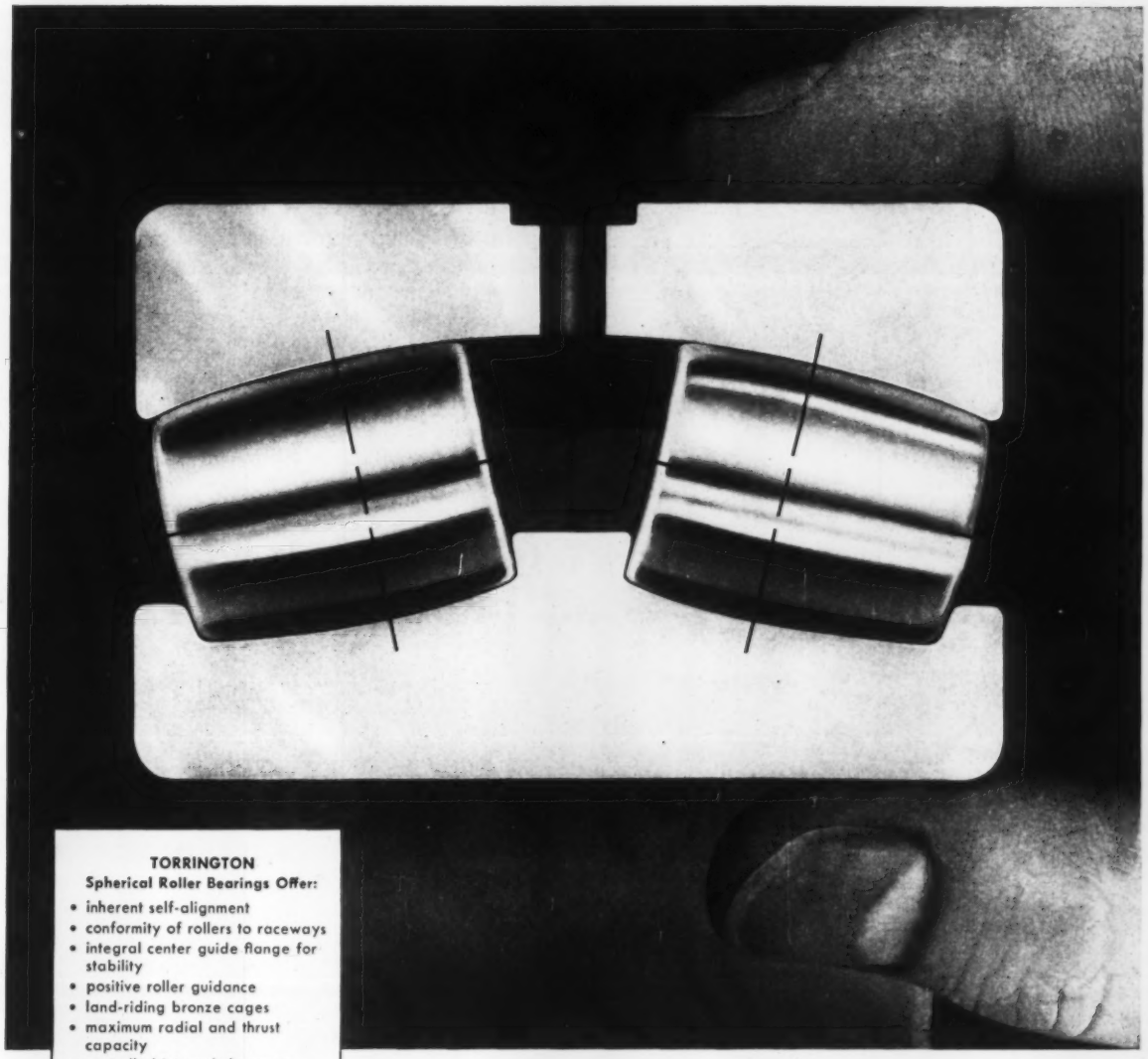
Counted Our Missiles Lately?

More than 250 U. S. missile projects have been started since World War II, reports the Association of Missile & Rocket Industries. Russian space exploits reportedly result largely from one big booster. Of the U. S. "birds," 60 are sponsored by the Army, 80 by the Navy, 90 by the Air Force, 12 by the NASA. About a dozen haven't yet found patrons. Over the last year, new missile names have appeared once or twice weekly, says AMRI.

Straws in the Wind

Allis-Chalmers Mfg. Co. has joined other makers of steam turbine generators in lowering prices by about 5 per cent . . . Deere & Co. says it will hold the price line on tractors and farm equipment . . . Sylvania Electric Products Inc. is lowering prices as much as 25 per cent on the conversion of germanium scrap . . . Inland Steel Co.'s new, $8 million, ore carrier, the *Edward L. Ryerson,* will be launched in January by Manitowoc Shipbuilding Inc. . . . Sales of goods and services through automatic vending machines will rise about 7 per cent (to more than $2.2 billion) this year, says National Automatic Merchandising Association . . . Burroughs Corp. says sales of used accounting machines jumped 50 per cent in the first month it made used equipment available to all sales outlets . . . R. C. Mahon Co. won the contract to furnish all structural steel for a $3 million plant addition at GM's Saginaw Steering Gear Div. . . . Consumer installment credit rose $485 million (seasonally adjusted) in September to $37.5 billion—up $4.4 billion from a year ago . . . Douglas Aircraft Co. blames its $25.7 million loss in the third quarter on heavy development costs and inventory writedowns from its DC-8 . . . General Motors Corp. is forming a Defense Systems Div. and appointing a new vice president, Harold Boyer, to head it . . . Great Britain proposes to remove most discriminatory import controls shortly . . . Reynolds Metals Co. will deliver 400,000 tons of bauxite from Haiti to U. S. stockpiles in '60.





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Spherical Roller Bearings Offer:

- inherent self-alignment
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- land-riding bronze cages
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- even load distribution
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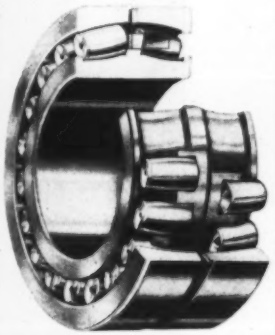


Send for new Torrington Spherical Roller Bearing Catalog #258.

Shaped for Stability!

The asymmetrical shape of each roller in Torrington Spherical Roller Bearings contributes directly to operating stability and long service life.

The maximum roller diameter is not at the center of the roller. Located towards the center flange, it insures geometric positioning of the roller for positive guidance with free rolling action.

The roller shape also approaches that of a tapered roller. Lines extended from the roller-to-race contact zone converge at the roller and bearing axes. This approach to true conical rolling action further assures stability.

These are two more reasons why Torrington Spherical Roller Bearings operate cooler, quieter and with greater stability. For the ultimate in bearing performance and service life, always specify *Torrington* Spherical Roller Bearings. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

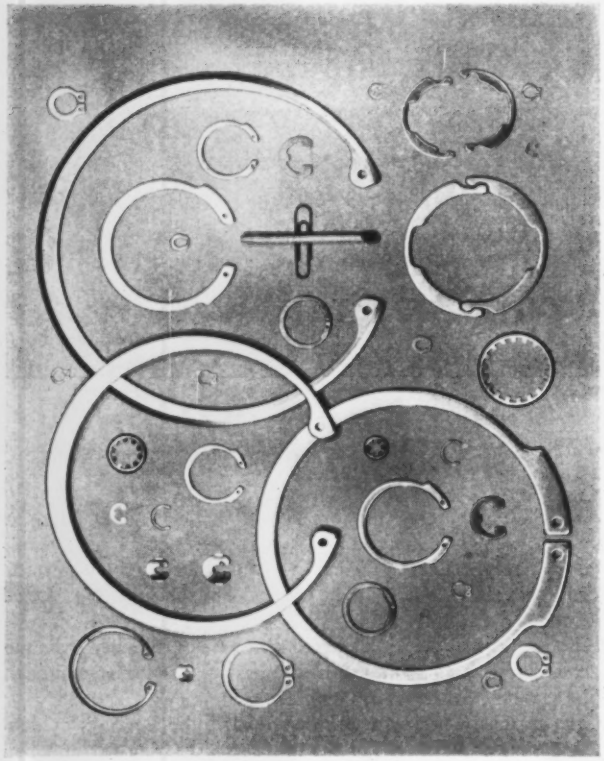
Every Basic Type of Anti-friction Bearing

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

Retaining rings in a multitude of shapes and sizes are speeding assembly and cutting production costs of a host of industrial and consumer products. A leading manufacturer of these efficiency-improving parts recently greatly expanded the range of applications for retaining rings by adding a complete line of standard and special rings of Armco PH 15-7 Mo Stainless Steel.

By taking advantage of the ultra-high strength, spring properties, good corrosion resistance and high temperature properties of this unique metal, they now produce retaining rings with performance characteristics heretofore unobtainable at reasonable cost. Their new PH 15-7 Mo rings have the necessary combination of strength and durability for economical service in chemical, food and beverage machinery; aircraft and missile components; units for nuclear

How Armco PH 15-7 Mo Stainless Steel Helped make a good product better



reactors, appliances; marine equipment; and other applications subject to severe service conditions.

Simplifies Ring Production

The simple heat treatment and good fabricating characteristics of Armco PH 15-7 Mo facilitate manufacturing operations. All types and sizes of rings can be produced because PH 15-7 Mo is available in sheets, strip, plates, bars and wire, including special cold drawn shapes that completely eliminate some production steps.

Consider the design and production advantages *you* can achieve with Armco PH 15-7 Mo or one of its companion grades of precipitation-hardening stainless steel, Armco 17-4 PH or 17-7 PH. Let us send you complete information. Just fill out and mail the coupon.

ARMCO STEEL CORPORATION
1939 Curtis Street, Middletown, Ohio
Send me complete information on your special Armco Precipitation-Hardening Stainless Steels. We are considering them for_____.
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Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

The Engineering Enigma

Judging from reader reaction, one of the most controversial questions in industry is: Who pays for engineering? (See STEEL, Aug. 31, p. 25.)

Reader comments follow two general lines. Here's what one group says:

"Our present procedure not only duplicates costs but wastes an important and scarce commodity—engineering ability."

"Too many customers expect us to send engineers half way across the country to discuss their problem. Invariably, they call in several more suppliers, all of whom are subjected to additional costs for engineering service."

"Plans, layout drawings, and detailed specifications taking weeks and months to prepare often receive little more attention than a one page letter noting price and delivery."

"Too many times, the buyer asks a half dozen suppliers to provide engineering service for which only one gets paid."

"In many instances, the net revenue of the successful bidder is less than the engineering costs of all bidders."

"Our competitors in Europe don't waste engineering talent the way we do in the U. S."

A second group defends the practice this way:

"As a buyer, we feel that our secret weapon is progress through competition."

"By asking for bids from several people we have access to advances in design and productivity. From a single source we would get only the old, proved method."

"Through competition, the customer can assemble the best features of all recommendations into a set of specifications which is then used for bidding purposes."

We don't pretend to have the ideal solution to a many sided problem that has been with us for ages—neither do we expect one in the near future.

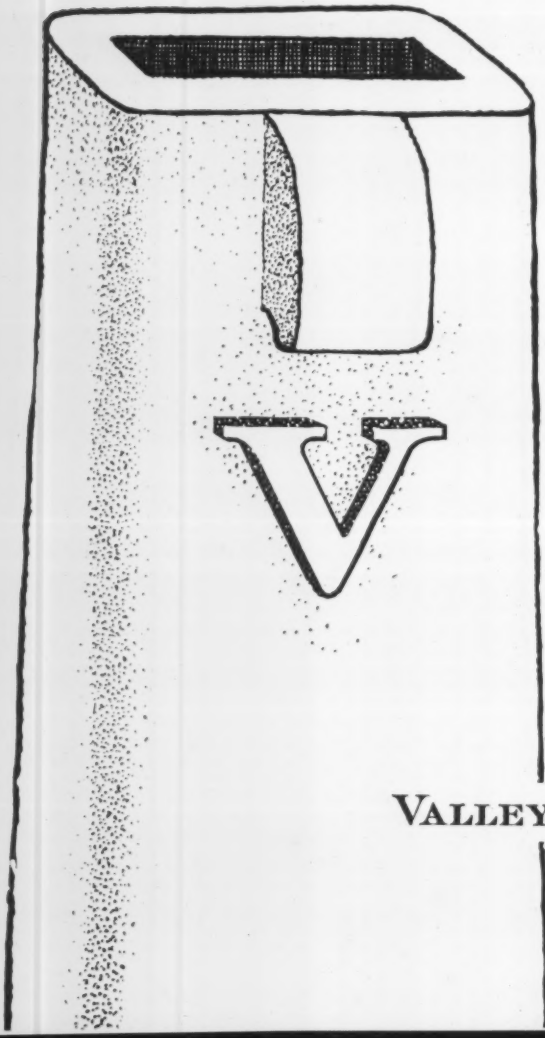
But we do feel better about the situation than we did only a short time ago. The problem has been pointed up, and a lot of thinking has been stimulated.

As soon as enough people are convinced that the present practice is inherently wasteful, we'll get some action.

So let's keep the ball rolling. Talk up the problem. Do some more thinking. And let us know how you're doing. We will welcome your ideas!

Irwin H. Such

EDITOR-IN-CHIEF



Tomorrow

we'll harness the energy of the sun . . . . .

but even then

steel will be poured into

VALLEY INGOT MOULDS

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: Hubbard, Ohio
WESTERN OFFICE: Chicago, Illinois
NORTHERN OFFICE: Cleveland, Ohio

How Steel Case Hits All Labor

THE STEEL CASE is affecting other metalworking labor negotiations at least three ways:

1. Many settlements have been deferred until both sides see what happens in steel.

2. Many managements have been encouraged by the steel industry stand to seek concessions from unions, particularly in the featherbedding area.

3. But the tougher management attitude has put union leaders in a mulish mood.

• **Net Result**—The chief effect of the steel case thus far has been fewer settlements, either because of deferrals or the inability of the two sides to get together. "Fewer wage settlements were announced during the latest three month period than during the second quarter," says the Bureau of National Affairs (BNA), Washington reporting agency. "This is contrary to the usual pattern. Many negotiators were waiting to see what would happen in steel."

BNA finds that the average negotiated wage increase for 1959's third quarter was 8.9 cents an hour —a penny less than in the second quarter. "In view of the favorable business climate," comments BNA, "this drop apparently can be attributed to the tougher management bargaining attitude sparked by the steelmakers."

• **Marking Time** — "Many of our contract situations are pending on the outcome in steel," confirms Ray Vacha, director of industrial relations for Associated Industries of Cleveland. AIC's experience is a good national bellwether because the northeastern Ohio area it serves is the site of virtually every kind and size of plant that operates in the U. S. "All types of unions, not just the steelworkers, are standing by," says Mr. Vacha.

"No one yet regards the Kaiser Steel Corp. settlement as pattern-making," he adds. The Big Steel pact will set the pace and "will importantly influence the future settlements, especially in the fringe and management rights areas."

• **Nonsteel Bargaining**—The major labor bargaining sessions now going on outside steel are in aluminum, copper, and the railroads. The United Steelworkers show no sign of rushing to apply the Kaiser plan to the aluminum industry (Page 218). Some union officials are reportedly none too happy with the Kaiser settlement and want to wait and see if they can do better with the rest of steel. In the meantime, the aluminum companies keep operating. Strikes continue to tie up much of the domestic copper industry. A settlement depends on steel (Page 106).

Two important railroad agreements on wages and work rules expired Oct. 31, but no strike is likely until about February. That's because rail bargaining, as governed by the Railway Labor Act of 1934, is as involved as a Chinese fire drill. The carriers have asked unions to take a 15 cent hourly cut. The unions counter with a demand for a 25 cent wage boost. The two sides are even farther apart on the work rules issue. Rail management is out to eliminate featherbedding; unions claim there is none to speak of.

• **Other Situations**—Another rough situation could develop in coal. President John L. Lewis has not yet given notice to terminate present United Mine Worker contracts. He can do so with 60 days' notice under open ended agreements, which technically expire in November (for bituminous) and in January (for anthracite). Presumably he

Strike Losses

(Through Nov. 9)

Lost Steelworker Wages

$1,172,500,000

Lost Sales

$3,493,000,000

Lost Production (ingot tons)

32,664,000

Other Losses

Overhead, depreciation, and salaries of nonproduction workers in steel.

$672,000,000

Tax Losses to U. S.

$755,000,000

is awaiting a steel settlement.

Major aircraft contract terminations are scattered from now until November, 1960. Electronics and appliances come up later in the form of the International Union of Electrical Workers terminations with Radio Corp. of America in June, General Electric Co. on Oct. 1, and Westinghouse Electric Corp. on Oct. 15. Autos, farm machinery, and an important segment of electronics (Sperry Rand Corp.) wait until 1961.

• **Additional Plants Down**—More than 400,000 metalworkers have been laid off for lack of steel. The number will increase by at least 50,000 a week for the next several weeks. Four of five metalworking plants will be out or nearly out of steel by the end of November. The steel producers need at least four weeks from the day men go back to work to reach 90 per cent of production capacity and six weeks to achieve that rate of shipments.

Lack of metal is forcing the auto industry to shift into low gear. Only a few General Motors Corp. assembly plants (mostly Corvair) are operating. Chrysler Corp. is working reduced shifts. So is Ford Motor Co. Studebaker-Packard Corp. and American Motors Corp. continue to operate at nearly full rates. AMC, in fact, reportedly plans another multimillion dollar expansion soon. For November, the industry expects to build 278,000 cars, a 45 per cent reduction from the 503,000 it assembled last month.

• **Optimistic Estimates** — Automotive and other steel users are uncomfortably aware that a quick resumption in metal production is possible only if facility damage is low and worker morale high—two assumptions that may prove false.

W. D. MacDonnell, president of Great Lakes Steel Corp., suspects it will cost three to five weeks from the time its men return to work and $1 million in repairs before the National Steel Corp. subsidiary is near normal operations.

And Kaiser Steel, the first major company to settle and get back on the job, is learning one of the prices of being idle for more than three months—four of its nine open hearth furnaces need rejuvenation. Two of the other companies that signed under terms similar to Kaiser's (Detroit Steel Corp. and Granite City Steel Co.) were not struck and didn't have the starting up problems.

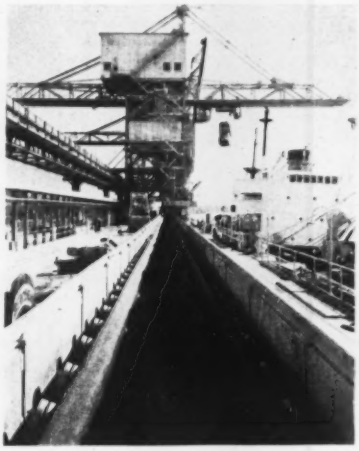
• **Why Kaiser Settled**—One reason Kaiser signed was that it didn't want to start up operations under a Taft-Hartley injunction. "Once you get into Taft-Hartley," Chairman Edgar Kaiser told STEEL, "you have to sell an industry rather than a company package to your employees. That is real strife."

Mr. Kaiser doesn't see the higher wages affecting domestic producers' share of the market. "I don't underestimate the growing importance of foreign competition on the American steel market, but I think perhaps it might have been overemphasized."

Continental Didn't Settle

Continental Steel Corp., Kokomo, Ind., has not settled with United Steelworkers of America, as erroneously stated in STEEL, Nov. 2, p. 37.

Continental reached an agreement in August which provides conditional acceptance of an agency shop—a major issue in Indiana where a right-to-work law prevents compulsory union membership. Under an agency clause, workers can be asked to pay the union a fee to compensate for representation, even though they are not members. Continental will adopt the clause only if major steel companies in Indiana accept it. The union agreed to drop the demand if such a clause is not included in big steel contracts. Wages and fringe benefits at Continental will follow the pattern set when the larger companies sign.



FOREIGN IRON ORE flows through the Burnside, La., Bulk Marine Terminal on its way to steel mills in Chicago and St. Louis. The Burnside facility serves as a trans-shipment point from ship to barge. The ore then travels up one of the nation's oldest "highways," the Mississippi River. Prior to the steel strike, the 1000 ton an hour unloaders in the background were handling 20,000 tons of iron ore a week. Practically none moved up the river less than a year ago. The unloaders, built by Dravo Corp., Pittsburgh, also handle bauxite and other ores

Labor Stirs Turmoil In Copper Market

EVEN THOUGH a big hunk of the copper industry has been strike bound for almost three months, daily developments keep the market in almost frenzied change.

The last few weeks have been marked by erratic demand, shortages, surprising price strength, and, of course, an uncertain labor situation.

• **Chilean Walkout Over** — News from the copper front is both good and bad. The four week strike at Kennecott Copper Corp.'s El Teniente properties ended Oct. 30, restoring production at the 16,000 ton a month operation. Benefits to the U. S. copper user will be indirect because the output is slated for European consumption. What the settlement will do is reduce the fever in the London Metal Exchange and consequently hold down the wild price gyrations here and abroad that have plagued the speculative copper market for the last few weeks.

At home, a break in the management-labor deadlock is no nearer. And the supply situation has been further aggravated by a walkout of workers at White Pine Copper Co. which produces about 3600 tons of copper a month and by an explosion which has cripped production at American Metal Climax Co. Inc.'s Carteret, N. J., refinery. Carteret has a capacity of 22,000 tons a month and was one of the few U. S. refineries still operating.

• **Price Outlook**—What you'll have to pay for copper products, if you're lucky enough to get any, becomes more uncertain. Early last week, a general move was made to base mill products on copper at 33 cents a pound. Reason: Because most domestic mining and refining facilities are struck, producers have to go to the open market and pay higher prices for their raw materials. However, it was not certain at press time that all mills would abandon the previous base price of 31.5 cents a pound. There also was a rumor that at least one primary producer would boost its price for foreign copper delivered in the U. S. to 33 cents a pound.

Detroit to Up Capacity

Detroit Steel Corp. will spend $75 million over the next five years to expand its Portsmouth, Ohio, facilities. The move will boost Detroit's ingot capacity from 900,000 tons to 1.8 million tons annually.

The first phase, costing $15 million, is to include a second pickling line and a second, four high temper mill. The five open hearths are to be changed to oxygen injection furnaces. Completion date: Early 1961.

The next phase, costing $60 million, is scheduled for completion in 1964. A battery of 40 more coke ovens will be built. Number two blast furnace, in which ore concentrates are to be used, will be enlarged. A new oxygen plant will also be built.

Ingot capacity is to be boosted with more oxygen open hearths, or by converting to the LD process.

The final part of the program will probably include a hot dip, continuous coil galvanizing line.

Most Earnings Top '58's Despite Strike

Excellent preparation for the steel strike enabled most firms to operate at a good clip throughout the third quarter. Brisk consumer demand for goods kept profits of most companies ahead of the 1958 pace. But business fell below the second quarter level because of seasonal influences, labor strife, and some steel shortages late in the quarter.

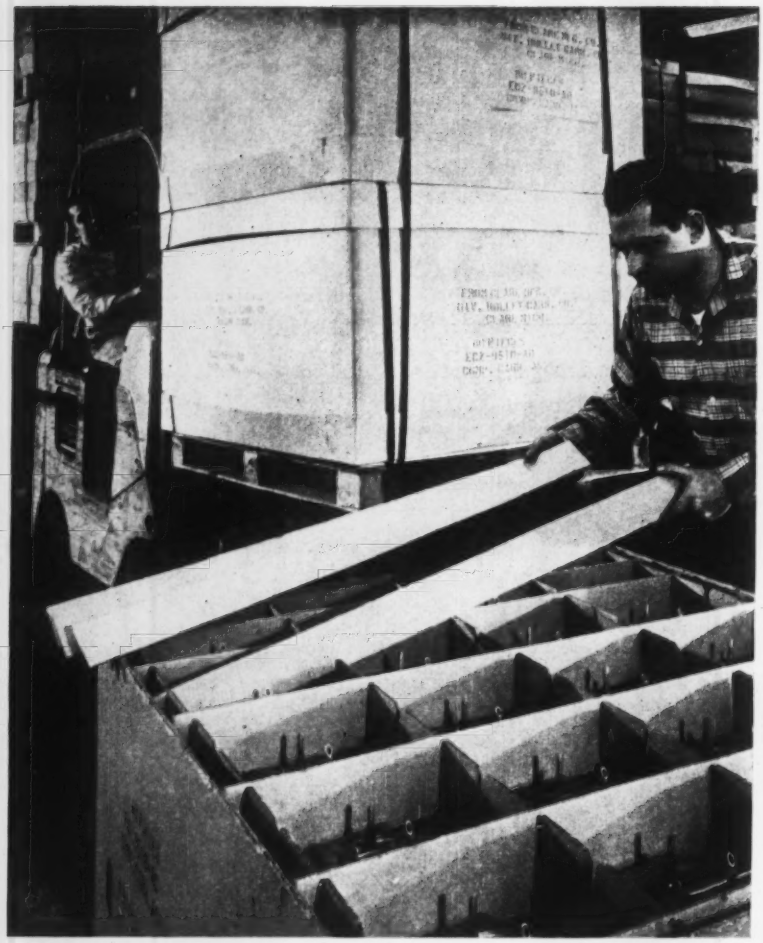
With steel supplies nearly exhausted and plants curtailing operations, the fourth quarter outlook is far from promising.

(Third quarter net profit)

SELECTED COMPANIES	1959	1958
Air Reduction Co. Inc.	$3,627,580	$3,199,688
Allis-Chalmers Mfg. Co.	10,140,189	5,034,813
Aluminum Co. of America	12,561,472	13,252,905
American Brake Shoe Co.	917,069	437,197
American Can Co.	18,653,*58	19,107,964
American Machine & Metals Inc.	718,117	425,375
American Radiator & Standard Sanitary Corp.	5,434,000	2,481,000
Bell Aircraft Corp.	1,516,098	3,386,936
Blaw-Knox Co.	393,000	1,426,000
Bridgeport Brass Co.	1,508,815	1,122,688
Budd Co.	256,000	1,468,000*
Buffalo Forge Co.	319,297	361,766
Burroughs Corp.	2,104,000	1,621,000
A. M. Castle & Co.	456,713	110,362
Caterpillar Tractor Co.	14,435,633	14,23*,327
Central Foundry Co.	361,108	241,708
Chance Vought Aircraft Inc.	1,209,651	2,487,666
Clark Equipment Co.	3,650,747	1,704,712
Clevite Corp.	1,414,000	931,000
Continental Can Co.	17,442,000	16,976,000
Cooper-Bessemer Corp.	1,345,397	801,000
Crane Co.	1,964,000	295,000
Douglas Aircraft Co.	6,483,000*	3,901,190
Ducommun Metals & Supply Co.	503,178	312,129
Eaton Mfg. Co.	3,615,259	1,098,076
Ekco Products Co.	1,371,015	900,717
Electrolux Corp.	684,114	453,937
Electric Autolite Co.	481,485	190,124
Fairbanks, Morse & Co.	448,159	84,380
Federal Pacific Electric Co.	1,109,394	701,162
Ford Motor Co.	53,200,000	14,900,000*
Gabriel Co.	106,022	104,832
Gardner-Denver Co.	2,154,842	1,225,028
General Electric Co.	72,273,000	58,589,000
General Instrument Corp.	402,500	266,561
General Motors Corp.	134,389,199	65,633,266
General Refractories Co.	207,291*	1,381,604
General Steel Castings Corp.	140,080	474,870
Harbison-Walker Refractories Co.	1,156,977	2,344,247
Hoffman Electronics Corp.	453,661	417,216
Hupp Corp.	272,000	33,000
Hussman Refrigerator Co.	764,061	830,234
International Business Machines Corp.	37,653,241	40,855,388

SELECTED COMPANIES	1959	1958
Johns-Manville Corp.	8,431,000	7,484,000
Kaiser Aluminum & Chemical Corp.	2,014,655	6,905,000
Kennecott Copper Corp.	10,936,217	14,811,203
Koppers Co. Inc.	1,268,000	1,558,000
Mack Trucks Inc.	4,168,524	1,595,502
Manning, Maxwell & Moore Inc.	266,000	317,000
Maytag Co.	3,448,092	2,591,*75
Metal & Thermit Corp.	329,573	210,741
Midland-Ross Corp.	839,146	542,603
Minneapolis-Honeywell Regulator Co.	8,494,961	5,847,624
National Cash Register Co.	4,475,345	3,277,327
National Malleable & Steel Castings Co.	109,179	421,525*
Parker-Hannifin Corp.	768,889	526,935
Pitney-Bowes Inc.	985,000	1,178,425
Porter (H. K.) Company Inc.	1,150,476	758,309
Pittsburgh Metallurgical Co. Inc.	66,738*	298,676
Pullman Inc.	2,790,685	1,748,501
Radio Corp. of America	7,900,000	6,300,000
Raytheon Co.	2,562,000	2,491,000
Revere Copper & Brass Inc.	7,658,037	2,166,075
Reynolds Metals Co.	10,313,938	8,860,*32
Robertshaw-Fulton Controls Co.	1,241,893	948,111
Rockwell Mfg. Co.	2,149,000	2,155,000
Rockwell-Standard Corp.	4,050,907	1,446,966
St. Joseph Lead Co.	943,768	405,055
Signode Steel Strapping Co.	991,438	1,033,297
Studebaker-Packard Corp.	3,399,940	9,218,316*
Thompson Ramo Wooldridge Inc.	1,642,397	1,817,471
Trane Co.	1,678,803	1,341,950
Union Carbide Corp.	36,556,722	34,608,087
Vanadium Corp. of America	246,708*	58,254
Westinghouse Air Brake Co.	2,980,398	1,363,607
Westinghouse Electric Co.	22,075,000	19,741,000
White Motor Co.	3,225,415	1,345,041
Woodward Iron Co.	1,424,689	974,929
Worthington Corp.	4,425,985	5,791,432
Yale & Towne Mfg. Co.	3,189,894	2,114,680
Yates-American Machine Co.	632,075	236,832*

*Loss.



Compact master shipper for automobile carburetors is readied for sealing

Packaging Offers Cost Cutting Opportunities

TODAY'S volume manufacturer has a packaging engineer on his payroll.

It's one of the most significant trends to come in the industrial packaging field in the last five years, reports Hinde & Dauch Div. of West Virginia Pulp & Paper Co., Sandusky, Ohio.

An engineer for an automotive parts supplier puts it this way: "Production is doing its job, but packaging must keep up or we'll use more people to box the parts than to produce them."

The practice of including the packaging engineer in the early stages of design can pay dividends. He might suggest a design alteration so a part can be nested or fastened in a shipping container.

The package is no longer just a cover; cost conscious managers recognize it as a selling tool.

• Advertising and color appeal can be big assets in industrial packaging. Like the retail buyer, the industrial buyer is also subject to impulse buying. Witness the popular use of plastics.

One of the selling points for the plastic "bubble" package is its attractive display of the product.

George Wiss, president of Plastofilm Inc., Wheaton, Ill., cites these advantages for transparent plastic packaging:

1. Instant recognition and identification as the result of displaying the entire part clearly.
2. Protection from dust, moisture, and corrosion.
3. Easier inspection and inventory control.
4. Easily read advertising, instructions, or identification symbols.

A leading manufacturer of hydraulic cylinders packages replacement parts such as retainer rings, gaskets, and bushings in plastic. Air Reduction Sales Co., Union, N. J., puts its cutting torch tips in a molded plastic box. Another manufacturer packs his throwaway carbide inserts in this manner. Economies are realized by the cutback in time needed for packing under the old method.

• Definite improvements are being made in corrugated containers.

Containers are engineered to provide better product protection and greater utility. High gloss inks and coatings are being tested to enable a box to resist scuffing. Nonskid solutions are available and applied to boxes to keep them from sliding.

An interesting concept is packaging parts to integrate into assembly line production. Gaylord Container Corp., a division of Crown Zellerbach Corp., St. Louis, designed a package for a manufacturer of home laundry dryer controls which can be used as an assembly line container. Parts are packaged to permit immediate assembly. The end user saves money and production is simplified and speeded.

• Packaging engineers are using other materials to advantage.

General Electric Co. is realizing savings of $33,000 a year over former methods by using wooden skids and polyethylene bags to cover its heavy transformers.

Federal Pacific Electric Co., New-

ark, N. J., cuts down on freight damage by enclosing large pieces of equipment in polyethylene bags. Larger equipment is sprayed with polyvinyl acetate which is peeled off at the point of installation.

• **Does industrial packaging cost the user more than it did five years ago?**

Some of the newer materials, special packages, and printed advertising messages do cost more. But automation and efficient package design are the keys to reducing overall costs.

Automatic setup, packing, and sealing equipment are used primarily in large volume, high speed, package filling and sealing operations. Long runs of a single product line permit economical operation of packaging equipment. Progress is being made in the development of packaging machinery which will handle a number of different box sizes at one time.

One of the best examples of automated packaging is the high speed, sparkplug production lines of AC Spark Plug Div., General Motors Corp., Flint, Mich. Sparkplugs come off the line at a rate of 140 a minute. Three machines pick them up, align them, drop each one in its individual container and put them in a shipping carton.

Packaging for protection in shipment and handling is primarily a technical problem, explains R. R. Newquist, president of Roots-Connersville Blower Div., Dresser Industries Inc., Connersville, Ind. But the creation of a package design may involve sales, research, marketing, engineering, purchasing, and production. That, he says, should be a concern of top management.

Imports Crowd Metal Show

A MASSIVE lineup of foreign machine tools and testing equipment shared in the 41st National Metal Exposition's "Preview of the Soaring Sixties" in Chicago last week. Visitors were probably given their best indication of the potential of foreign competition.

Foreign equipment on display included lathes, milling machines, jig borers, electrical discharge machines, and ironworking equipment. One importer displayed a complete wire drawing line for welding electrode cores. Foreign producers also showed optical and metallographic preparation equipment.

Eleven countries were represented: West Germany, Japan, Italy, Sweden, Belgium, England, Switzerland, Austria, Denmark, France, and Canada. Many of the exhibits were attended by foreign nationals.

• **Signs of Space Age**—Touring the aisles of the International Amphitheatre in search of new ideas, metalworking men peered through dark masks into vacuum chambers where refractory metals were being joined with electron beam welding. They hefted parts made of beryllium, columbium-tungsten, and tantalum. They examined the microstructures of vacuum melted materials.

They listened to experts in explosive forming and hardening explain techniques of the new metalworking fields. Aware of the great need for high material quality in nuclear and Space Age applications, visitors to the show exhibited high interest in the many displays of ultrasonic, x-ray, and radiation type testing equipment.

Two displays sought to attract metalworking plants to California and Florida. The Los Angeles Department of Water & Power pointed to advantages of industrial location in its area. To lure more industry, the city offers the assistance of a plant location specialist.

The Florida Development Commission boasted that metalworking is outstripping every other category in Florida's industrial growth. The expansion is attributed to the state's sensible taxes, labor abundance, and excellent climate.

• **Technical Meetings** — Running concurrently with the Metal Show were technical meetings of five associations: American Society for Metals, Society for Nondestructive Testing, American Institute of Mining, Metallurgical & Petroleum Engineers, Metal Treating Institute, and Metal Powder Industries Federation.

"In the 400 exhibits from 40 states and several foreign countries, and in 275 technical presentations by the co-operating groups, the Metal Show lived up to its theme—Materials and Fabrication Preview of the Soaring Sixties," said Clarence H. Lorig, outgoing president of the American Society for Metals.

Next year the Metal Show will be at Convention Hall, Philadelphia, Oct. 17-21.

Metalworking men browse through exhibits at the National Metal Exposition

To improve labor problems some divide melon and get . . .

- Better productivity.
- Less turnover and absenteeism.
- Closer ties with union local.
- Closer identification of employees with stockholders.
- Less waste.
- Improved morale and team spirit.
- Less resistance to new technology.
- Less need for close supervision.

Can Profit Sharing Help?

WATCH FOR A BOOST in enthusiasm for profit sharing.

The stimulus: The steel strike, say profit sharing's growing band of advocates. In their judgment, profit melons should be sliced and consumed by all who have had a hand in their cultivation.

Is profit sharing the key to the steel deadlock? "It might be," says Adm. A. C. Burrows, USN (Ret.), president of the Council of Profit Sharing Industries, Chicago. But first we need an atmosphere of greater trust and identity of interest between employee and employer.

Adds J. J. Jehring, director of the Profit Sharing Research Foundation: "The problem in steel is not how to improve collective bargaining in the conflict situation, but how to move from conflict to cooperation." This he feels profit sharing could do.

• **McDonald Shies** — Although David J. McDonald, president of the United Steelworkers, has issued a cry for a "just" share of the industry's "fantastic profits," he's not about to demand formal, profit sharing programs. Reasons:

1. The union regards them as instruments of the devil, proposed by management as an alternative to negotiating higher wages and benefits.

2. There's an element of risk: No profits, no sharing.

3. Profit sharing might cause USW members to gravitate toward management, weakening the international's hold.

Mr. McDonald is joined by many managements in opposing profit sharing, but for different reasons. Chief among them is that the plan isn't equitable because all employees do not contribute equally to higher profits.

• **Reuther Tries** — Rushing in where other union leaders fear to tread, Walter Reuther, president of the United Auto Workers, has promised that he'll seek profit sharing in the 1961 auto bargaining.

But profit sharing continues to make new gains. For some managements, it has proven to be an effective tool for boosting productivity. Some programs have failed.

There are three basic programs: 1. "Deferred" plans are used by 49 per cent of the council members. The employee's share is put in trust and paid out later—usually at retirement. 2 "Cash" plans are favored by 34 per cent. The employee's share is paid periodically—once a year or oftener. 3. "Combined" plans are favored by 17 per cent. Part of the employee's share is deferred and part is periodically disbursed.

• **Yardstick**—Council officials emphasize that profit sharing is always a supplement to an employee's income, never a substitute for any part of his pay. It's not a production bonus system or work incentive based on piecework or specific, reduced labor costs.

A plan that conforms not only to all U. S. legal requirements but also to the council's definition should: 1. Be based on profits. 2. Apply to all regular employees, subject to eligibility rules. 3. Be formalized and written. 4. Be communicated to employees. 5. Distribute funds at regular intervals and in an established pattern. 6. Provide payments that are above prevailing wages.

• **Number in Operation** — The council estimates industry has about 30,000 profit sharing plans. Roughly 1500 are in metalworking firms, 40 per cent of which are unionized. Last year, North American business and industry shared $750 million with 2 million employees. This year, distribution will probably reach an all-time high of $1 billion.

In 1958, the average per capita payment in companies employing fewer than 500 workers was equal to 13.6 per cent of annual pay. In firms having 500 to 4999 employees, it was 9.3 per cent of earnings; in

the 5000 to 10,000 category, 8.6 per cent; in companies with more than 10,000 employees, 7.5 per cent.

• **Benefits**—Profit sharing enthusiasts say their programs pay off handsomely (see data at right).

"Under profit sharing, employees can measure their personal economic success in terms of the company's success," says Robert W. Galvin, president of Motorola Inc. "In poor profit years, they can see a direct benefit to them in helping the company resume a profitable climb."

Inaugurated back in 1947, Motorola's profit sharing fund has increased in value 17 times. An employee contributing $200 annually to the fund has received $5.13 for each dollar invested and now has $13,480 in his account.

• **No Extra Costs**—"Profits shared do not entail increased costs of production," Admiral Burrows declares. "Shares of profits are not costs at all. They are a split of the net operating proceeds or profit. Moreover, the profits shared with participating employees are extra profits which would not exist without the extra employee concern for company success which profit sharing engenders."

• **Failures**—The council estimates that less than 3 per cent of the programs have failed. It cites five common reasons: 1. Failure to sell the plan at the outset and to explain fully its mechanics. 2. Mergers or changes in management; new owners may not believe in profit sharing. 3. Companies may be too young or too small; rapid expansion may have drained their cash reserves. 4. Profits nil or too small to be meaningful. (General Electric Co. dropped its program because some employees received as little as $17 in the last year it operated.) 5. Owners set up a plan as a tax dodge, caring little whether it benefits employees or spurs productivity.

"Profit sharing will not succeed," the council warns, "if undertaken as a sudden, strategic alternative to unionism or to legitimate collective bargaining as established by law."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Profit Sharing in Chicago

How fast is profit sharing catching on? In what fields is it making most headway? How does it stack up against other fringe benefits?

To find out, the Chicago Association of Commerce & Industry queried 677 firms employing 335,000. Findings: 45 per cent, or 306, have profit sharing. Of these, 43 per cent say it's more beneficial to them than any other fringe they provide.

Firms Polled . . .	Firms	Employees	Employees Unionized
Manufacturers	324	194,169	45%
Retail & Wholesale	97	58,217	19
Service Industries	118	14,909	30
Transportation & Public Utilities	36	41,760	77
Finance, Insurance & Real Estate	62	21,233	0
Construction	40	4,637	83
Total	677	334,925	42

Firms having profit sharing and percentage naming it most effective of all benefits they provide

Type of Firm . . .	Total Firms	Firms with Profit Sharing	Profit Sharing Firms Naming it Most Effective
Manufacturers	324	145	37%
Retail & Wholesale	97	57	54
Service Industries	118	47	49
Transportation & Public Utilities	36	8	25
Finance, Insurance & Real Estate	62	24	42
Construction	40	25	52
Total	677	306	43

Companies reported these effects after installing profit sharing

Effect on . . .	Increase	Decrease	No Change
Profits	53%	8%	39%
Work Stoppages	0	8	92
Wage Rates	18	2	80
Output per manhour	55	1	44
Capital Investment	19	5	76
Selling Prices	8	3	89
Labor Turnover	2	67	31

Three Answers to Manpower Needs

The Engineering Technician . . .

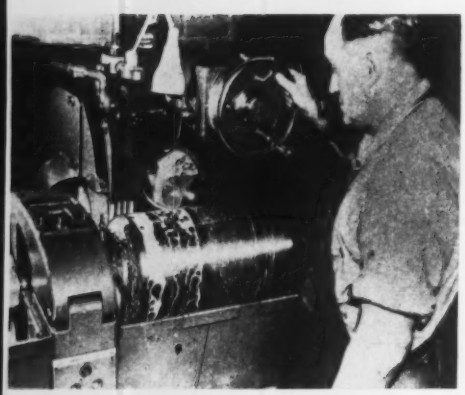
PROGRESSIVE companies have long used supporting personnel to relieve their engineers and other professional people from more routine tasks. But the full benefits of using such employees have seldom been realized. In the coming decade, management must delegate more functions to technicians; it's a good way to beat manpower shortages.

• **Who He Is**—The technician serves the engineer (or scientist) and the skilled worker as a liaison man. He is familiar with the basic scientific principles of the engineer and the tools of the skilled worker.

• **His Qualifications**—He must have a high mechanical aptitude, a working knowledge of science and mathematics, the ability to express himself clearly to engineers and skilled workers alike, and a knack for getting along with people.

• **His Training**—He should have all the mathematics, science, and English he can get in high school. And, generally, he should complete a post-high school technical program—usually taking two years. You can get lists of accredited programs from: Engineers' Council for Professional Development, 29 W. 39th St., New York 17, N. Y. (enclose 25 cents), or National Council of Technical Schools, 1507 M St., N.W., Washington 5, D. C.

• **His Employment Areas**—These industries are the major users of



The Older Worker . . .

LOOK FOR companies to relax their informal bans on hiring older workers. And expect some modifications in mandatory retirement policies. The manpower shortage of the 1960s will bring about those changes. While the number of men in the labor force between the ages of 25 and 44 will remain almost static in the coming decade, the number of workers over 45 will increase markedly (see STEEL, Oct. 26, p. 97).

The nation's work force will increase by 10 million in the coming decade; 2.25 million of the gain will be accounted for by men and women over 55, says the National Association of Manufacturers.

• **Dispelling Misconceptions**—The NAM asserts: "Older workers represent countless years of rich and seasoned experience, judgment, and stability." Assignments like quality control and inspection are often handled better by older workers, reports the Small Business Ad-

Women . . .

A TRADITIONAL BARRIER is being cracked. It'll be shattered in the coming decade. Industry is beginning to accept women in managerial, technical, and other professional or skilled posts.

• **Where**—In the coming decade, women will account for half the growth in the labor force, U. S. Labor Department officials predict. Expect them to appear more frequently in these kinds of jobs: Engineering technicians, market researchers, personnel managers, economists, financial specialists, statisticians, computer programers, mathematicians, technical librarians, purchasing agents, engineers, accountants (15 per cent of all accountants and auditors are women).

• **When**—The Labor Department predicts that the number of women over 40 in the labor force will increase sharply in the next ten years. The number between 25 and 34 will advance significantly after 1965. More than 35 per cent of them will

technicians: Aircraft and missile, chemical, construction, electrical and electronic, instrument, primary metal, machinery, appliance. Others are fast learning the benefits they can gain by employing technicians.

The types of jobs technicians fill will vary from one industry to another. But this list will give you an idea of the many tasks they can perform: Drafting, calculating, designing, expediting, collecting and collating data, making changes in drawings, cost accounting, record keeping, market research, filing, requisitioning, checking orders for material, specifying, preparing charts and graphs, computing, modelmaking, report writing, supervision of skilled workers, preventive maintenance, technical sales, production planning, customer service, operation of experimental equipment, preparation of surveys and studies, liaison work, miscellaneous legwork.

• **Where to Get Him**—A prime recruiting method is visiting technical institutes much the same way as you recruit from colleges.

You might also recruit from your local high schools. The students you hire can attend night school while they work for you. It's important to make high school job counselors aware of the opportunities for students in the field.

Check your own production people—and your whitecollar workers. An aircraft manufacturer awards scholarships for night courses at technical institutes to employees who show aptitudes for technical work. Under a General Electric Co. plan, employees can attend college and receive a refund of the tuition upon satisfactory completion of the course. GE also recruits from community colleges and junior colleges.

Another source is returning servicemen. Thousands have put their armed forces training and experience to work as technicians in industry.

Check your suppliers. One of them may have an internal technical institute that will train your young men to be technicians.

• **Is He Available?**—Demand for technicians exceeds supply. But technical institute enrollment is on the rise. Here's the trend: 1957 enrollment jumped 10.2 per cent over that of 1956; 1958 showed a gain of 1.2 per cent over 1957; 1959 enrollment rose 5 per cent from the 1958 peak.

Sources: Engineering Manpower Commission, American Society for Engineering Education, Society of Professional Engineers.

ministration. Here's what SBA research found about the traits of older workers:

• **Absenteeism**—The absentee rate declines consistently as age increases, shows a study of 18,000 employees in more than 100 companies.

• **Accident Rate**—Workers over 45 have less than the average number of injuries.

• **Productivity**—"Output stays about the same in most people through age 55," reports SBA.

Most employers (92.7 per cent) questioned in an NAM survey said the work performance of older people was equal or superior to that of younger employees.

• **Turnover**—Another NAM survey finds less turnover among older people than among younger ones.

• **Accuracy**—Older workers offer these "quality" advantages, says SBA: 1. Greater experience in job performance and ability to adapt. 2. Greater stability in handling assignments. 3. Critical judgment, insight, and recognition of an action's potential effects. 4. Patience.

• **Supervision**—Older workers generally need less supervision. In fact, they will often work better alone or in small groups, contends SBA.

• **Attitude**—Older workers' attitudes toward their jobs are equal or superior to those of younger employees, said 99.2 per cent of employers questioned by NAM. Employers call older workers "more dependable," "more emotionally mature," and "less involved in outside interests."

work in professional fields.

In the latest decennial census (1950), women were reported in all 446 occupations listed. About 3 in 10 women were clerical workers; another 40 per cent were about evenly divided among the professional, service, and operative classifications.

• **Who**—STEEL talked with some of metalworking's lipstick and slipstick set. Typical comments:

Says Mrs. Ruth Evans, secretary-treasurer, Plating Service Inc., Columbus, Ind. (who worked her way up from production inspector and bookkeeper to top management): "Opportunities for women in industry are definitely increasing. Women are gaining acceptance."

Says Mrs. Elsbeth Strathern of Zonta International (an organization of 14,000 professional and executive women): "More women will become purchasing agents."

Asserts Mrs. LaVone Dietrich, export specialist, Beckman Instruments Inc., Fullerton, Calif.: "In some cases, women have a definite advantage in that they tend to act more on intuition which gives them an insight to how another person will react."

• **Future**—Listen to what David Sarnoff, chairman, Radio Corp. of America, told a Washington conference in 1955: "We have no women vice presidents at RCA. But I think that there will be and I think that there should be."

• This is the third article in a four part series. Extra copies are available until supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Senator Kefauver's price probe can decide . . .

Will Steel Be '60 Scapegoat?

THE SIGNS on Capitol Hill appear unmistakable: The steel industry is almost certain to become the scapegoat for any ills of the national economy next year. A scapegoat is a must in a Presidential election year.

Sen. Estes Kefauver (D., Tenn.), chairman of the Antitrust & Monopoly Subcommittee, is already at work. He met with Chairman Edgar F. Kaiser of Kaiser Steel Corp., following that firm's settlement with the United Steelworkers. Senator Kefauver says there is no need for an investigation of the steel industry at this time. (Mr. Kaiser had reported to the senator that his firm would do everything it could to avoid a steel price hike within the next nine to 12 months.)

But the implication is: The senator will investigate the rest of the industry if it is forced to raise prices as a result of its union settlement. (The Kaiser settlement has been termed inflationary by the big steel firms; presumably, prices would have to go up if they settled on Kaiser's plan.)

The Industry Is Boxed In

Ironically, if the rest of the industry holds out for an agreement which is better than what Kaiser obtained, and low enough to be noninflationary, Capitol Hill will still see cause for sacrificing the industry. Such a holdout would probably cause the union to strike again after an 80 day breather under Taft-Hartley and a second strike would come with Congress in session.

The presumption is that a second strike would involve the same emergency conditions the Justice Department now finds: A shortage of certain alloys and shapes for defense projects and a rapid fanning out of unemployment to the extent that it imperils national health and safety.

The pressure on Congress and the administration to draft a law putting the industry back to work would be irresistible. The possibility of nationalizing the industry for an emergency period has been discussed in high Commerce Department circles, although such a plan is certainly not endorsed there. Discussions have taken place only because the officials realize pressure will come from other government sources.

Unemployment of 1 million to 2 million stemming from the steel strike could wreck the Republicans' chances of winning the White House in November, 1960.

Air Force Plans GSE Standardization

Metalworking firms interested in producing ground support equipment (GSE) for missiles will soon be able to get an Air Force technical information file that's designed to avoid duplication of equipment. Available equipment will be shown to avoid extensive development of items which are not needed. The Defense Department has requested the three services to get together on the program, but so far the Air Force is doing it alone.

Examples of need in the area: Air conditioners are built by 12 to 15 manufacturers; probably only three are needed. The Air Force is also concerned about the standardization of generators.

Basic to the program is the AF's plan to ease equipment maintenance requirements. Too many systems call for a maintenance engineer, says one source, but the service must use airmen with only a high school education.

Army Plans Surplus Tool Disposal

With the Pentagon in its annual belt tightening process, look for a series of moves to cut costs in relatively nonpolitical areas—machine tools, for example. The powers that be would tend to avoid pruning a whole missile system for fear of bringing Congress, labor, and industry down on them.

Out of one government agency last week came the fearsome tale of an Army plan to dispose of about 30,000 fairly new tools, which are on standby for tank production. Such a program would have amounted to about one-third of the Army's tool inventory, or more than 10 per cent of all government owned tools. STEEL has been assured by responsible sources that no such sale is contemplated, but the rumor persists. Army sources report they will dispose of some 2500 tools in the next six months.

Congress Plans New School Bill

Congress is working hard to come up with a school construction bill which President Eisenhower would be willing to sign next year. The pressure to sign in an election year may turn the trick. The Health, Education & Welfare Department reports school construction will drop significantly next year. School bond sales in the fiscal year ended Aug. 31 were 20 per cent below the previous 12-month total.

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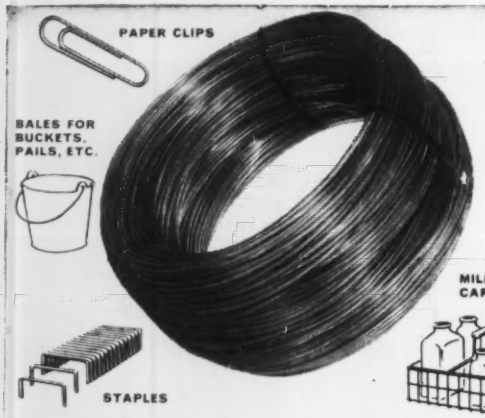

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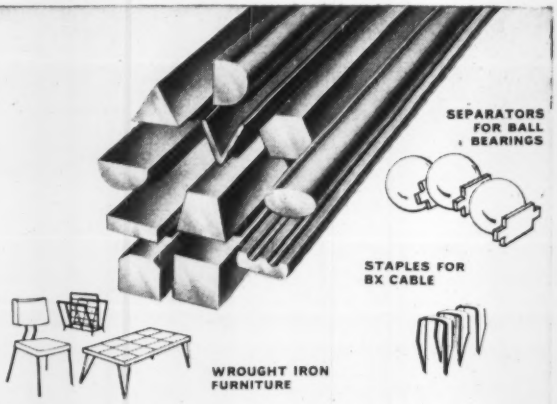

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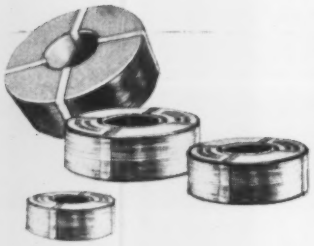

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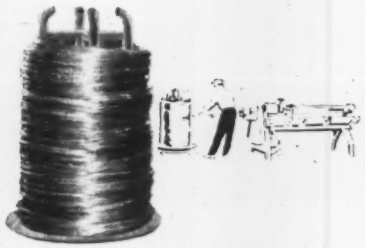

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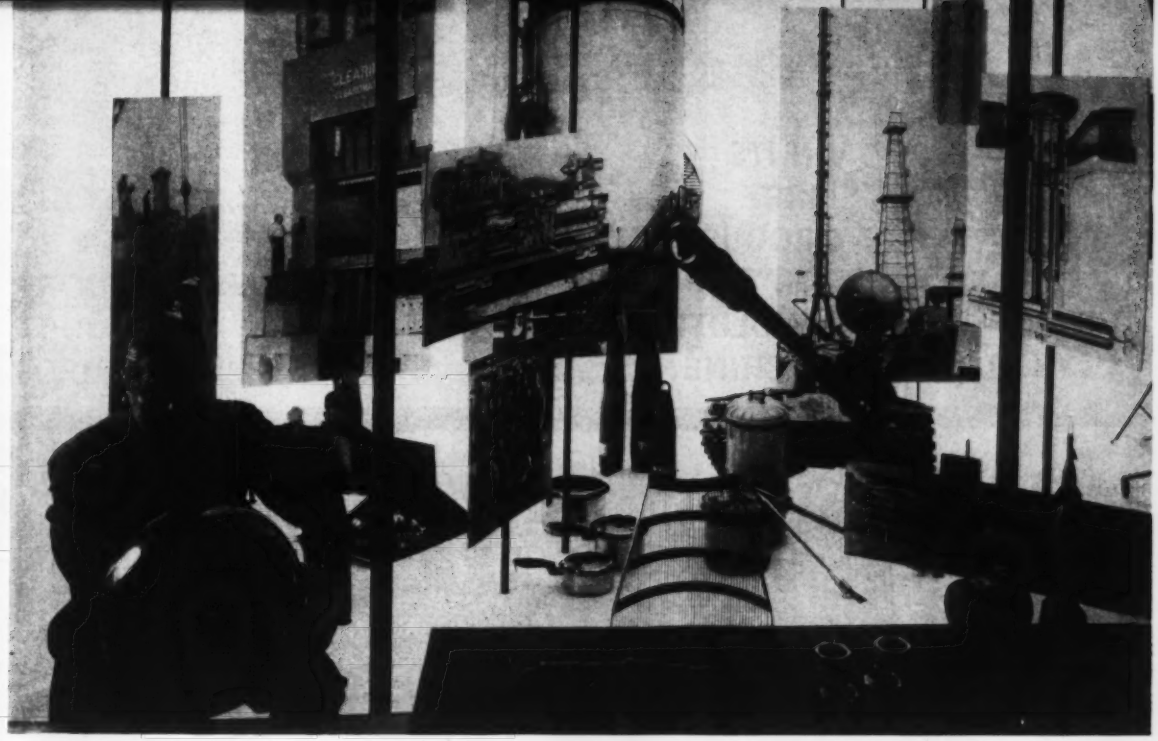


Displayed here are products of U. S. Industries Inc. and the areas in which they're used

USI Forms Diverse Image in Decade

DIVERSIFICATION has put U. S. Industries Inc. squarely behind the numerous products pictured here.

The firm's program has been on a scale that would warm the heart of "Diamond Jim" Brady, who sold all-steel railroad cars turned out by Pressed Steel Car Co. (forerunner of USI) near the turn of the century.

Little more than a decade ago, Pressed Steel Car Co. was at the brink of bankruptcy. A major management overhaul in 1948 put the company on the track of bold expansion and diversification.

Pioneering in new fields now ranks as a family trait in the complex of companies and divisions that make up U. S. Industries. Pressed Steel Car Co. had also pioneered with its all-steel rolling stock, but a steadily declining market, the only one it had, left it in desperate financial straits. The firm's new management team produced a gradual shedding of listless railroad business, disposed of unprofitable production facilities to make elbowroom for diversified expansion.

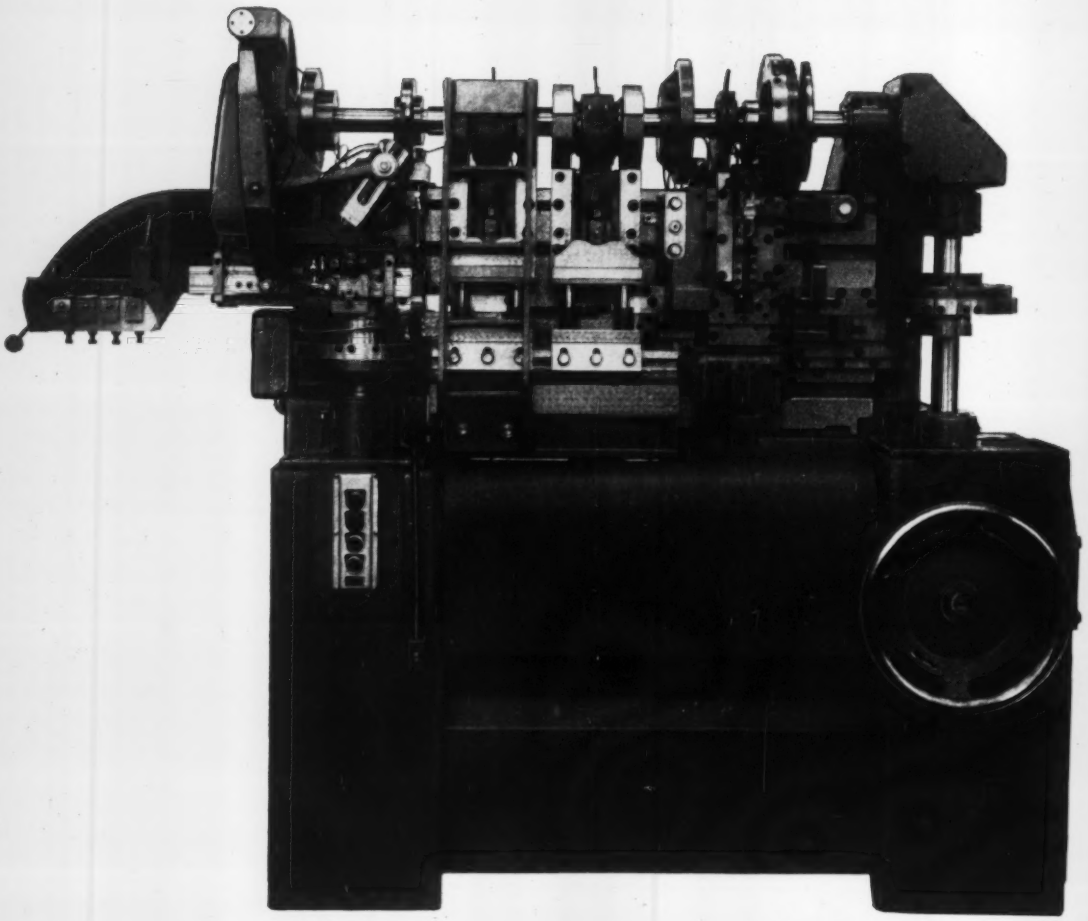
• **First Step** — Its first acquisition was the 1949 purchase of Solar-Sturgis Mfg. Co., Chicago, a maker of stainless steel dairy equipment. As the Solar Permanent Div. of USI, this producer now turns out bulk milk cooling tanks for dairy farms as well as several lines of stainless steel kitchen cookware.

Pressed Steel Car Co., and the last of its railroad car business, disappeared in 1954 with the emergence of U. S. Industries Inc. The same year, USI acquired its biggest division, the former Clearing Machine Corp., now employing more than 1100 at plants in Hamilton, Ohio, Chicago, and Los Angeles. Clearing produces and designs mechanical and hydraulic power presses, heavy duty engine lathes, and other production machinery.

• **New Talents**—U. S. Industries today is a family of 14 autonomous manufacturing and selling divisions. The family has been formed through outright purchases of companies, issuance of debentures, stock transfers—or a combination of all three. In every case, the corporation has been strengthened by the management talent of acquired firms who have remained with the company. USI's growth, into new fields ranging from missile and weapons systems to pots and pans, has paid off handsomely. Annual sales have risen from $41 million in 1949 to a 1957 high of $110 million. (Sales in last year's recession dipped to $86 million.)

USI is banking heavily on research and development, both at the corporate and division levels, for its continued growth. It also plans expansion of its world trade through exports, imports, and foreign production facilities. More acquisitions are also probable.

ON ITS FIRST PRODUCTION JOB THIS REVOLUTIONARY MACHINE...



It's the sensational Torrington **Verti-Slide**, a most important **new** production tool. This amazing new vertical four-slide machine promises a genuine revolution in the **high-speed, high-precision, low-cost production** of just about everything in strip or wire that is now being produced on progressively tooled forming presses or conventional four-slide machines. Write or call today for complete technical data—or a Torrington sales engineer.

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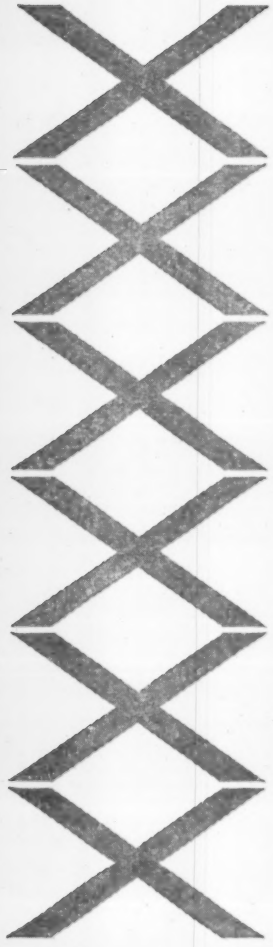

Help Your Industrial Seller

An estimated 20,000 distributors, mill suppliers, agents, and warehousemen serve metalworking. Here are tips on how you manufacturers can work better with them.

1. **Put your sales policy in writing and publicize it well.**
2. **Give complete pricing information fast, especially when you change quotations.**
3. **Allow adequate profit margins, but police any price fighting.**
4. **Give complete marketing information about your products.**
5. **Be generous with sales and technical help, both to train the independent's personnel and to aid his customers.**
6. **Get sufficient coverage for the territory (with more than one representative, if necessary), but avoid oversaturation.**
7. **Provide formulas and other information on inventory levels to encourage the independent to keep adequate stocks.**
8. **Be fair but firm on credit.**
9. **Check your seller's accounting methods.**
10. **Heed your representative's advice on packaging.**

A MAKER OF shop tools was dissatisfied with the job his industrial distributor was doing for him in Los Angeles.

He added two distributors (with the original's reluctant approval). In three years, the manufacturer's sales in the Los Angeles area quadrupled. Even the original seller's volume in the line is 50 per cent above what it was in 1956.

• **Double Aid**—The shop tool firm helped the independent seller and helped himself. The action made better use of that part of our distribution system which this year will move an estimated $10 billion in manufacturers' goods (products for other manufacturers' use—capital equipment and accessories, mill supplies and metal).

Manufacturers have trouble dealing with the independent sellers, partly because there are so many different kinds. Wholesalers of industrial supplies and equipment (also called mill suppliers) number at least 2000, stocking anywhere from a few lines to 50,000. An estimated 15,000 manufacturers' agents don't warehouse anything but are private businessmen acting as part-time salesmen for two to half a dozen manufacturers. In addition, more than 1300 warehouses distribute metal; some 240 firms distribute new machine tools —and so it goes.

• **Supplier's Job**—The manufacturer must stimulate the independent seller to do a better job. The approach is the same as that toward any selling group, but it's more difficult with the independent because he's not your employee; because he can't devote all his time to you; because he can rarely be as familiar with your product as you would like.

Experts agree that you can help your independent seller to help you by doing the things set forth in the accompanying checklist, particularly:

• **Standard Policies**—Treat all your distributors alike. Besides being the legal thing to do, it will pay off in morale.

The wise supplier also has one official in charge of relations with distributors. He's the man to see that the independent seller devotes a fair amount of time to the manufacturer's line; that the independent carries adequate inventories (unless he's a representative and stocks nothing); that the independent's legitimate complaints are attended to.

• **Pricing and Profits**—The National Industrial Distributors Association reports that its members last year had average profits of only 0.77 per cent on sales. They're doing better in 1959, but the 1958 memory is still green.

Robert G. Welch, executive vice president of the American Steel Warehouse Association, suspects that part of the problem with seller-manufacturer relations is that the distributor too often works with his eye on the supplier first. "Look at the customer first," advises Mr. Welch. Only when the emphasis is right will the distributor make great strides in improving productivity.

New harmony between seller and supplier can come via a joint study of profits. Most experts agree that manufacturers are ahead of distributors in accounting procedures. The supplier can teach his sellers plenty. For example, most independents

to Help You

concentrate on a product with a high gross profit. Yet that item may be far more expensive to sell than one with a low gross but a higher net return.

Price fighting is a continuing problem too. It was rampant in last year's recession and is still going on. Experts advise: Don't scrimp on the markup—20 to 30 per cent is customary. If a seller persistently price fights, drop him.

• **Help, Help, Help** — Standard Tool Co., Cleveland, which sells entirely via the independents, has a typical approach in helping its distributors. It advertises nationally; its servicemen call on distributors' customers to solve technical or other problems; it has one engineer who conducts clinics in factories or other convenient spots to show how tools work and how to use them better.

Manufacturers' schools for distributors are gaining in popularity. Boston Gear Works's program is outstanding, and so is that of Parker-Kalon Div., General American Transportation Corp., Clifton, N. J. Also helpful is the traveling show for distributors such as that put on by Cambridge Wire Cloth Co. (see the accompanying story).

• **Territory Coverage**—The trend is toward multiple distributorships. Exclusives often give trouble eventually. Distributors change; one who's good now may slip five years from now.

Columbian Vise & Mfg. Co., Cleveland, does grant exclusives in the smaller and intermediate markets but prefers multiple distributorships in major areas.

U. S. Rubber Co. has found it essential to spark its distributors to new efforts. "In this kind of selling, it's not the competing manufacturer who is your major competitor but the other products in the distributor's line which take up so much of his time."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

How to Help the Dealer's Sales

YOUR SELLING organization may be ripe for the short course on "How to Sell a Prospect" being offered to distributors around the country by Cambridge Wire Cloth Co., Cambridge, Md.

Cambridge, a producer of woven wire fabric for industrial conveyor systems and material handling slings, is briefing its distributors in a step-by-step selling and demonstrating plan for its line of Gripper Slings. Most important to the sales pitch, says J. M. McCandless, Cambridge sales representative, is the plan itself. With an outline to follow, the salesman will be sure to cover the important points in the most effective sequence. (Also, adds Mr. McCandless, it doesn't hurt if the salesman has attractive, well-kept samples or demonstrators to exhibit.)

Here are the essentials of the plan:

• **Prompt Follow-up.** If the salesman is answering the prospect's inquiry in response to supplier's advertising, he should not delay. A prompt call will catch him while the idea is still fresh, and impress him with the seller's fast service.

• **Determine Applications.** The first thing you have to know is what job your product will have to do and where other products have failed. If special metallurgical properties are needed, they will have to be detailed to the supplier.

• **Use Demonstrators.** Where the salesman has a miniature or full size sample of his product, it can be more easily explained. If it is a working sample, it can be left with the prospect for more thorough inspection.

• **Stress Product Qualities.** Now is the time to point out all virtues of your product. If the salesman is informed about competitive lines, he can compare and evaluate them in terms of the prospect's own applications.

• **Get Into the Plant.** Here is where the seller can bring all his guns to bear, while keeping an eye out for opportunities to compare his products with other products, and suggest applications which the prospect may not be aware of. Here too is where the salesman quotes prices and costs, cites savings in such use costs as labor and maintenance, points out safety features, and explains ultimate or long range cost of his lines in terms of longevity and replacement or repair costs.

• **Be a Name Dropper.** Be sure the prospect knows that the well known XYZ Corp. uses your product in a similar job.

• **Push Special Features.** Where your product is available in special coverings, sizes, or models, be sure the prospect knows how they could benefit him.

• **Make Demonstration.** If you can substitute your sample product for the one in use, do it on the spot and point out the ways in which it is better or can be adapted to alternative uses.

• **Ask for the Order.** It's as easy as, "If you'll give me an order, we'll ship them immediately."

• **Ask for Leads.** Find out if the prospect can name other men in like positions who might be able to use your product. Follow up.

Improved cutting performance... plus rancidity control

From Esso Research after two years of field testing comes a new heavy-duty emulsifiable cutting oil that combines all these outstanding advantages:

Deeper cuts, faster speeds, longer tool life. Kutwell EP 66 contains extreme pressure agents that enable it to handle the toughest cutting, grinding, sawing and drilling jobs. Milling a high-alloy steel, for instance, a jet engine component manufacturer reports output jumped from 35 to 117 pieces per tool grind after Kutwell EP 66 replaced a high-cost specialty oil.

Machine lubrication—Kutwell EP 66 leaves an easy-to-see film of oil on the ways, cams and working parts of the machine tool for highly efficient lubrication.

Rancidity control – Kutwell EP 66 contains an effective bactericide selected by Esso Research to keep emulsions sweet smelling and serviceable for longer periods of time.

For special alloys and other tough machining jobs, Kutwell EP 66 will outperform conventional soluble cutting oils and many high-cost compounded mineral oils. An Esso representative will be glad to show where Kutwell EP 66 can do a better job in your operation.

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In industry after industry..."ESSO RESEARCH works wonders with oil"

Auto Suppliers See Market Share Shrinking

Expanding auto sales in the next decade will mean higher dollar volume for autodom's suppliers, but the independents fear captive shops will take a larger slice of their market

PERHAPS they're unduly pessimistic, but 61 per cent of the automotive venders replying to a STEEL survey think the percentage of sales dollars they'll get from auto business will be less in 1965 than it is today.

Their reports show it has already shrunk considerably since 1950, despite the fact that unit output has climbed and will continue to expand as motordom envisions annual sales in the 7 million to 8 million car range by 1965.

Most suppliers blame captive shops for the situation. Decentralization, materials, and design changes are also listed as culprits. To counteract the trend, venders are turning to all kinds of cost cutting techniques and seeking new markets and products. A fortunate few don't feel that is necessary. They make specialized items Detroit must have to build its cars.

• **Seeks Answers** — In making its survey, STEEL contacted 100 leading independent automotive suppliers making a variety of metal products for cars. The aim: Find out if vender claims about vanishing business are true. If so, what's causing the change? What are suppliers doing about it? Each firm was asked what percentage of its dollar sales volume in 1950, 1955, and 1959 came from automotive. Each was also asked what volume was anticipated for 1960 and 1965.

The responses tend to substantiate claims that some venders are getting less business. The figures, coupled with comments from respondents, show that stampers and forgers are suffering most among those finding their business shrinking. Other types of fabricators are getting the same amount of business (or more) as car designers specify different types of materials or different manufacturing methods.

You'll notice, for example, that extrusions show a relatively small decline. They may be in for a slight revival as carbuilders discover aluminum extruded parts often can replace stamped or cast parts made from zinc or steel. One example appears to be bumpers which reportedly will begin appearing in 1961 as extruded aluminum shapes rather than drawn steel.

• **Gets Them**—Survey results show that 61 per cent of the respondents believe they'll have a lower percentage of dollar sales from automotive sources by 1965. Some 28 per cent say automotive sales volume will be unchanged, and 11 per cent predict their share of car business will increase. Among the optimists are makers of radiators and mufflers, and trim and fastener fabricators.

What are the reasons for this shift away from suppliers? Of those firms that expect a loss, 66 per cent say captive operations are the prime reason. Only 18 per cent list material and design changes as the No. 1 cause. Decentralization is picked as first choice by 15 per cent of those queried.

Those percentages are substantiated when reasons are ranked in one, two, three order. Half of the venders surveyed state that material and design changes are the second biggest reason for the shift in their business. Decentralization is rated as the second choice by 42 per cent. Only 8 per cent think captive shops deserve a No. 2 rating as the cause for business losses.

• **Offer Solutions**—What are suppliers doing to counteract this expected shift? More than half (59 per cent) are involved in cost cutting procedures. They fall into three basic areas: Modernization of plant and equipment, use of new materials

Percentage of Vender Business Going to Autodom

Product	1965	1960	1959	1955	1950
Stampings	60	62	63	67	72
Castings	50	56	61	53	63
Forgings	49	52	52	58	70
Extrusions	39	39	37	48	44
Others	56	74	73	66	72

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and manufacturing methods, and redesign of parts to reduce pieces and simplify fabrication. One firm says it's using foreign steel to save on material costs.

Another 20 per cent indicate the most important thing they're doing is to develop new products—sometimes in the automotive field, but more frequently in completely different areas. That naturally leads to new markets and 10 per cent of the companies say they're relocating to meet the changing markets.

Only a few firms indicate they're no longer interested in automotive work. One company whose once dominant auto business has steadily declined, indicates it will be out of the field completely by 1965. It asserts: "We no longer are making any special efforts to sell this field." Another curtly reports: "Not interested!"

• **Still Eager**—But most suppliers still hope to latch onto a share of Detroit's lucrative business. And for this reason it's worth noting that only four companies referred to improved service, quality, or delivery as chief ways to retain contracts; yet those are the first things any auto company purchasing man wants to investigate after he's asked about price. They may come so high on the "standard operating procedure" list that many venders overlooked them. It may be the same reason only one company said it was concentrating on "harder selling" to hold business and get more work.

1961 Model Gossip

Now that 1960 cars are on the road, Detroit's word merchants are turning their attention to 1961 models, their engineering and styling.

GM's B-O-P car still is causing much speculation on the circuit. Insiders claim the company is dragging a red herring through tool shops to hide what it's really trying to do. Last week, they said the "herring" was talk of a separate small car for Pontiac Div. in addition to the B-O-P small car which Pontiac is supposed to share with Buick and Oldsmobile. STEEL doubts the story, but several of its sources agree on so much of the information that it should be passed along.

According to the rumors, this second Pontiac car is a tiny sports type model; the six cylinder, aluminum engine is supposed to be in Pontiac's experimental labs right now; a smaller, four cylinder version is planned for those who want a sporty body, but economical operation. One informant claims the car will have a plastic body (a la Corvette), and that it will be available in hardtop and convertible models. Styling is along Corvair lines.

More rumors: Although the six cylinder engine reportedly is a bored out version of Corvair's air cooled mill, the tiny four cylinder job is water cooled and will be front mounted. An interesting sidelight: Power will be transmitted to a rear mounted transaxle by means of a flexible driveshaft which works a bit like a revolving torsion bar.

While the "Pontiac story" is intriguing, a car like that just doesn't seem to meet GM's present marketing philosophy. It still looks like only one small car with minor styling and design variations will be shared by all three B-O-P divisions. It's doubtful that Pontiac would be allowed to go so far off on its own.

GM's Recovery Strong

General Motors' net income for 1959's first three quarters is almost double last year's. Earnings were $725 million on sales of $8.8 billion compared with $399 million on $6.7 billion sales in 1958.

Average employment so far this year is 569,456. Last year it was 518,452. Employees received $2.3 billion in wages in 1959's first three quarters. Last year they earned $1.9 billion.

Frederic G. Donner, GM's board chairman, reports that before it closed down for lack of steel, the company produced 475,000 1960 cars and trucks. That brings total nine month vehicle production to 3.08 million against 2.34 million units in the same period last year. Of those, 2.4 million were built in U. S. plants (vs. 1.7 million in 1958); 665,201 were assembled in Canadian and overseas factories (vs. 585,060 in 1958).

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
August	239,152	180,447
September	258,157	130,460
October	503,000†	261,701
10 Mo. Totals	4,839,689†	3,135,973
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
Oct. 3	105,720	34,464
Oct. 10	118,793	34,834
Oct. 17	133,480	45,387
Oct. 24	112,488	70,973
Oct. 31	103,013†	97,804
Nov. 7	65,000*	125,279

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

• Mack Trucks Inc. reports it will close its Plainfield, N. J., plant in an effort to consolidate its operations. The plant has 3200 workers. Mack may consolidate at its Allentown, Pa., facilities which has 4000 employees.

• Chrysler Corp. still is plugging our newest state, Hawaii. E. C. Quinn, sales vice president, says the company expects to sell 25 to 30 per cent more cars in the islands in 1960 than in 1959. Meanwhile, the corporation is busily sending out engineering teams through its plants on time-motion and material studies in an effort to bring down manufacturing costs (they're higher than anticipated with the unitized bodies).

• Harold Churchill, Studebaker-Packard Corp.'s president, affirms that more than 30 million of the 70 million cars expected to be sold in the next decade will be Lark size. He says we are approaching the "sensible sixties," and adds that Lark sales have jumped 46 per cent since introduction in an effort to meet the challenge.

• A. O. Smith Corp., Milwaukee, is closing its Smith-Erie Div. factory at Los Angeles and is shifting most of the production to the Erie, Pa., plant. Major products are service station pumps and metering equipment for the oil industry.

CASE HISTORIES

DeWALT POWER SHOP
High-volume N D precision ball bearing with popular Sentri-Seal gives radial arm saw new sales appeal . . . while lowering costs! Bearing is lubricated-for-life for maintenance-free performance.

Ball Bearings Cut Power Saw Production Costs $30,000 A Year!

CUSTOMER PROBLEM:

Manufacturer of popular radial arm power saw sought ways to lower over-all production costs, yet maintain high precision standard.

SOLUTION:

N/D Sales Engineer, cooperating with customer engineers, developed and recommended a different rotor and shaft design that maintained original, high motor efficiency. The new design provided for the use of an N/D *high-volume* precision ball bearing. Savings in bearing costs alone add up to $30,000 a year!

In addition, the N/D precision ball bearings are equipped with low torque, performance-proved Sentri-Seals® which protect precision bearing parts against saw-generated dust. What's more, these N/D bearings are lubricated-for-life . . . they require no periodic maintenance.

If you're looking for ways to cut production costs . . . or ways to add new sales appeal to your product, why not call your New Departure Ball Bearing Sales Engineer? He can probably engineer a cost-saving, high-volume N/D precision ball bearing into *your* product. Just call or write New Departure Division, General Motors Corporation, Bristol, Connecticut.

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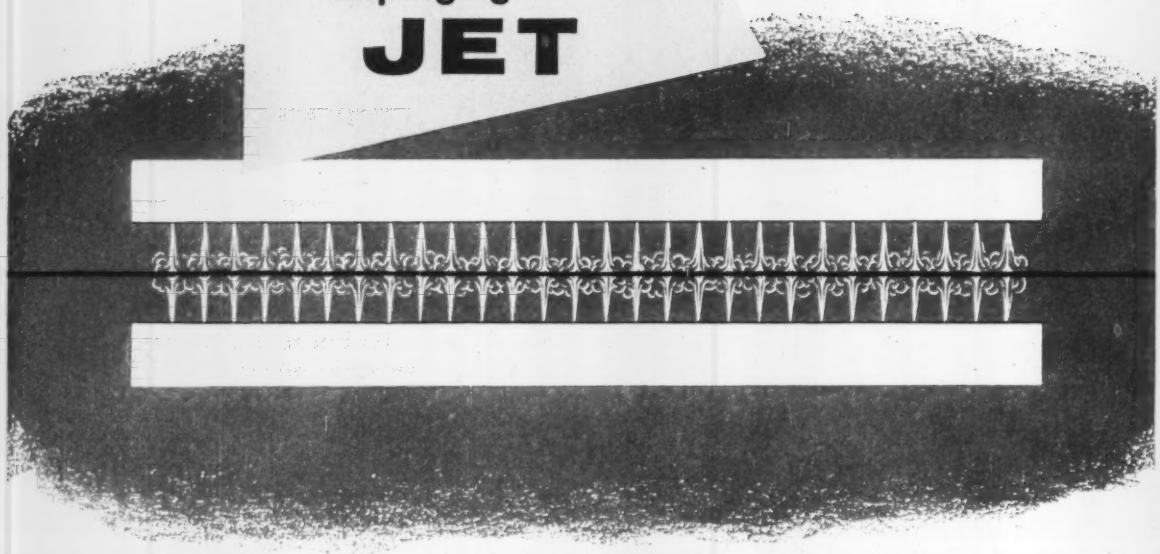

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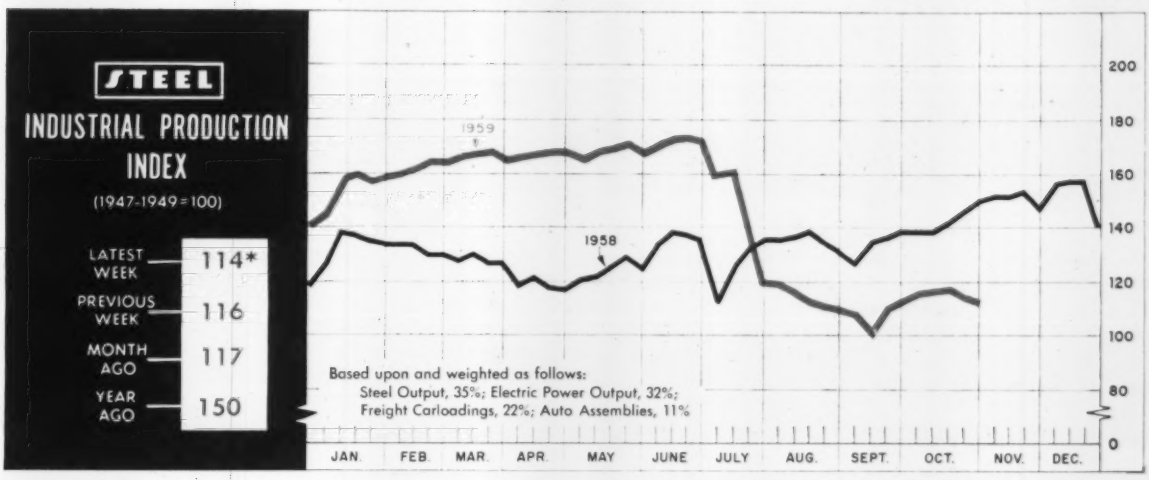

*Week ended Oct. 31.

Building Faces First Postwar Dip

FOR THE FIRST TIME in the post-World War II era, construction will not be one of the major forces in an economic boom. The best it can do in 1960 is help sustain general business at a high level.

• **Slippage Underway** — Both contract awards and work put in place are in declines dating back to midsummer. In June, contracts for future construction, as reported by *Engineering News-Record*, were running 10 per cent ahead of the 1958 pace. Today, the gap has closed to 4 per cent. The strong upturn in the second half of last year does not account for all of the relative change. F. W. Dodge Corp. began reporting a softening in contract awards in July, when the monthly total failed to measure up to seasonal standards.

Value of work put in place has been following a similar pattern. The peak was reached in May, with each monthly decline since then getting larger on a seasonally adjusted basis. The dropoff is accounted for almost wholly by residential construction (where the lag between contracts and work put in place is short) and public building (which varies with the vicissitudes of the political scene). Housing began to drop off in May.

• **Records in '59**—But the level of business in this important industry is still relatively high. The declines so far have been mild, and they came too late to spoil the chances of records for this year. Contract awards will top previous highs by a scant 1 or 2 per cent. Work put in place will total close to $55 billion before the year is over, compared with $49.1 billion in 1958.

• **Outlook**—Dr. George Cline Smith, vice president and economist for F. W. Dodge, foresees a dip of 1 per cent in contract awards next year. They will total $36.040 billion compared with an estimated $36.505 billion in 1959. While most cate-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	382[1]	371	2,011
Electric Power Distributed (million kw-hr)	12,750[1]	12,762	12,330
Bituminous Coal Output (1,000 tons)	8,110[1]	7,870	8,712
Crude Oil Production (daily avg—1,000 bbl)	6,850[1]	6,875	6,911
Construction Volume (*ENR*—millions)	$318.5	$261.0	$272.9
Auto, Truck Output, U. S., Canada (*Ward's*)	125,972[1]	139,981	122,558
TRADE			
Freight Carloadings (1,000 Cars)	600[1]	607	674
Business Failures (Dun & Bradstreet)	250	252	275
Currency in Circulation (millions)[3]	$31,873	$32,026	$31,299
Dept. Store Sales (changes from year ago)[3]	+8%	+10%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,523	$27,915	$22,079
Federal Gross Debt (billions)	$291.8	$289.9	$280.7
Bond Volume, NYSE (millions)	$32.2	$26.2	$31.8
Stocks Sales, NYSE (thousands of shares)	19,105	13,887	20,737
Loans and Investments (billions)[4]	$104.6	$104.1	$94.1
U. S. Govt. Obligations Held (billions)[4]	$28.5	$27.5	$31.9
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	246.65
STEEL's Nonferrous Metal Price Index[6]	226.5	226.5	215.6
All Commodities[7]	119.3	119.1	118.6
Commodities Other than Farm & Foods[7]	128.6	128.5	126.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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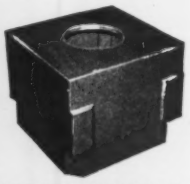

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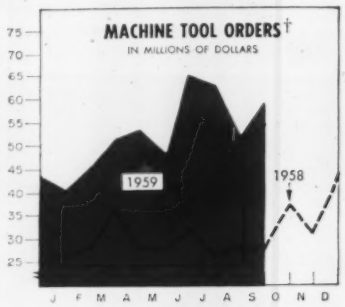
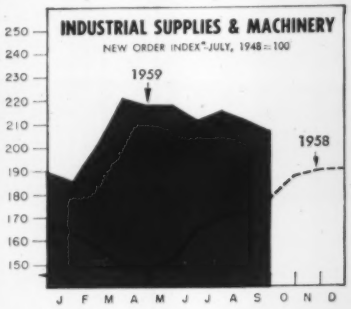
THE BUSINESS TREND





	New Orders 1959	New Orders 1958	Shipments 1959	Shipments 1958
Jan.	41.050	26.850	31.300	57.800
Feb.	45.400	28.300	36.050	48.050
Mar.	51.550	36.150	45.750	54.150
Apr.	53.200	28.300	45.000	50.900
May	48.700	28.050	41.000	50.100
June	65.400	32.100	50.050	45.500
July	63.400	26.550	40.600	29.700
Aug.	52.200	28.300	40.300	29.800
Sept.	59.600*	28.100	45.800*	34.900
Oct.	.....	37.000	.....	41.400
Nov.	.....	30.700	.....	33.650
Dec.	.....	43.900	.....	43.950
Totals	.....	374.300	.....	519.900

†Metal cutting and metal forming.
*Preliminary.
National Machine Tool Builders' Assn.
Charts copyright, 1959, STEEL.

	1959	1958	1957	1956
Jan.	186	163	221	190
Feb.	202	157	219	190
Mar.	221	149	210	190
Apr.	218	148	203	195
May	218	152	199	199
June	212	164	199	197
July	216	170	197	203
Aug.	212	172	197	211
Sept.	207	178	203	203
Oct.	...	187	192	206
Nov.	...	189	180	220
Dec.	...	190	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

gories will show an improvement, Dr. Smith declares they will not overcome the slippage of about 10 per cent in home building. That would put new housing starts at slightly under 1.2 million units.

He predicts a pickup of 7 per cent in nonresidential building contracts (for both floor area and dollar volume). Manufacturing construction awards will continue the strong gains of 1959 and show another 20 per cent rise in 1960. Commercial building will be up 6 per cent, and school building will gain about 2 per cent. Heavy engineering will rise slightly—about 2 per cent—on the strength of a better year for both road building and electric utilities work.

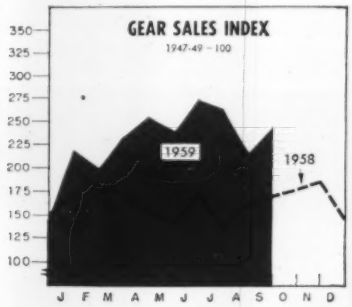
Costs will continue to mount—perhaps 2 per cent, but builders and planners will stretch the dollars farther by cutting many projects, such as schools, to the bare essentials.

Dr. Smith told STEEL that he feels this over-all decline in contract awards will show up rather quickly in work put in place, largely because most of the drop will be concentrated in home building. The declines already evident will be felt in the first half of 1960, with the softness continuing throughout the year. The over-all total, however, should come close to the record figure of 1959. "But if the housing drop gets too steep in the early part of the year, there is the possibility Congress will take some action, although none is on tap right now."

• **Still Hope for '60**—The Department of Commerce is in the process of preparing its 1960 outlook for construction (due toward the end of this month). It will be a big surprise if its report puts this industry in anything but the neutral column of the 1960 economic scoreboard. The way it looks now, 1960 will come close to matching this year's record. This could be the first year since 1945 in which the industry failed to improve its year-to-year dollar position. But one government official holds out this prospect: "Any downtrend in work put in place could be moderated because of the huge backlog of unfinished work carrying over into 1960. It is significantly bigger this year than it was a year ago."

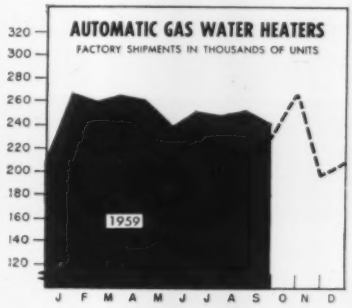
Index Drops Again

STEEL's industrial production index continues to show the effects of the steel strike. During the week



	1959	1958	1957	1956
Jan.	218.6	174.5	259.3	245.5
Feb.	199.9	179.1	239.5	256.2
Mar.	234.3	173.7	262.4	276.5
Apr.	255.6	153.2	221.7	264.7
May	241.0	142.2	243.2	275.6
June	274.2	173.8	215.9	245.4
July	262.8	133.3	211.4	286.7
Aug.	213.3	162.1	225.8	219.5
Sept.	243.9	170.7	174.9	230.5
Oct.	....	175.9	207.0	299.8
Nov.	....	182.7	165.3	216.2
Dec.	....	145.5	150.8	235.7
Avg	....	163.9	216.4	254.4

American Gear Mfrs. Assn.



	Shipments—Units 1959	1958	1957
Jan.	266,200	235,400	214,900
Feb.	259,700	216,300	208,200
Mar.	265,900	221,600	226,600
Apr.	261,300	221,900	238,200
May	239,300	210,000	233,400
June	250,000	231,000	211,700
July	247,000	221,400	192,500
Aug.	251,200†	215,500	210,300
Sept.	240,000†	230,000	215,500
Oct.	.....	265,900	234,700
Nov.	.....	197,100	173,500
Dec.	.....	207,300	172,800
Totals	.....	2,673,400	2,532,300

*Preliminary.
Gas Appliance Mfrs. Assn.

ended Oct. 31, the preliminary reading of 114 (1947-49 = 100) reflects the serious cutbacks in the auto industry caused by steel shortages.

Last week, General Motors Corp. used up practically every scrap of steel it had. Only Corvair and Buick plants were in production. Chrysler Corp. is on three and four day schedules, and Ford Motor Co. is having problems with parts which are holding it to far less than normal production. But by cutting back to three and four day workweeks, Ford can probably maintain moderate output into December.

Steel output is still carrying on at about 13.5 per cent of capacity. By this week, the full force of renewed operations at Kaiser Steel Co. should be felt, but its influence on STEEL's (or any other general business indicator) will be small.

Railroad freight carloadings in the week ended Oct. 24 rose to the highest level—607,347 cars—in four months. The big factor was grain loading—the biggest week for any comparable period since 1924—but coal and miscellaneous loadings also showed new strength. However, this factor in the index was counterbalanced by further declines in production of electricity as manufacturers curtailed operations.

Economists See Good Year

Next year will be a record breaker, indicates the yearend poll conducted by F. W. Dodge Corp. Out of 273 of the nation's leading economists, 65 per cent see a steady rise during 1960. However, they are less sure of this than they were a year ago, when 86 per cent foresaw a steady climb throughout 1959. Three of the most important forecasts are:

• **GNP**—The poll showed a median prediction of $514 billion for gross national product by the fourth quarter. The 50 per cent range (25 per cent of the replies on either side of the median) ran from $501 billion to $522 billion.

• **FRB Index** — The economists picked a median of 160 (1947-49 = 100) for the December, 1960, reading of the Federal Reserve Board's industrial production index. The 50 per cent range went from 158 to 165.

• **Plant & Equipment**—The median forecast was $36.5 billion, about 10 per cent above the latest official forecast for 1959. The total range: A dismal $28 billion to $40 billion plus.

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Nioloy Rolls	Forged Steel Rolls	

CHARLES R. FUNK
CF&I div. chief metallurgist

H. M. REIGNER
Eaton Div. products mgr.

LEWIS WILLNER
Luria Bros. v. p.

M. D. AYERS
Kennecott engineering dir.

Charles R. Funk was named chief metallurgist, Eastern Div., **Colorado Fuel & Iron Corp.** He has headquarters at the division's Claymont, Del., plant. He was manager of metallurgy and engineering of Alco Products Inc.

H. M. Reigner, sales manager, Aircraft Div., was appointed new products manager, Valve Div., Eaton Mfg. Co., Battle Creek, Mich.

William J. Schmuhl was made purchasing agent, Michigan City, Ind., plant of **Pullman-Standard Div.**, Pullman Inc., succeeding **A. J. Bruggeman**, retired. **W. J. Knaak** succeeds Mr. Schmuhl as assistant purchasing agent.

R. K. Hopkins was made vice president and general manager, Steel Div., **Firth Sterling Inc.**, Pittsburgh. **J. T. O'Brien** remains operating vice president of the Steel Div., responsible to Mr. Hopkins for all aspects of production. **J. S. Roller** continues as vice president-sales, also reporting to Mr. Hopkins.

At the Utica, N. Y., Div., **Bendix Aviation Corp.**, **Howard A. Alexanderson**, chief engineer, was named director of engineering. **Bernard Goldberg**, executive engineer, was named chief engineer, current products. **Henry Troeger**, a supervisory engineer, was named chief engineer, advance design.

F. P. Ciambrone was named assistant general manager of **Stromberg-Carlson Div.** at San Diego, Calif., General Dynamics Corp.

Lewis Willner was elected vice president of **Luria Bros. & Co. Inc.**, Chicago, division of Ogden Corp. He was supervisor of the Chicago district. In his new post as vice president-Chicago, he has authority for administration and operation of all activities in the Chicago area.

W. Hubert Beal was elected president and chief executive officer, **W. L. Maxson Corp.**, New York. He succeeds **Hugo A. Leander**, now chairman. **William L. Maxson Jr.**, secretary, was elected vice president.

Sidney Weiser was made director of engineering for **USI Robodyne Div.**, Silver Spring, Md., U. S. Industries Inc.

Walter A. Steiner was appointed vice president-technology, **National Carbon Co.**, division of Union Carbide Co., New York.

Henry Herman was named divisional sales manager, **General Magnaplate Corp.**, Belleville, N. J.

Howard J. Smith was made assistant to the vice president of **Pemco Corp.**, Baltimore. He was a member of the Sales Div., Titanium Alloy Mfg. Div., National Lead Co.

William E. Hoctor joined **Westinghouse Electric Corp.'s** Air Conditioning Div. at Staunton, Va., as manager of manufacturing.

Hans W. Weickardt was named section chief of stress analysis in the Research & Development Div. at **Solar Aircraft Co.**, San Diego, Calif.

M. D. Ayers was made director of engineering, **Kennecott Copper Corp.**, New York. He joined the company in 1956 as assistant to the president and has been engaged in special assignments. Prior to joining Kennecott, he was chief engineer, Wheeling Steel Corp.

George Pope was made manager of manufacturing at the Cicero, Ill., plant of **Hubbard & Co.** He was manager of Metal & Thermit Corp. plants in Chicago and New Jersey.

John C. Madden was appointed sales manager, oil country tubular products, **National Supply Co.**, Pittsburgh. He was tubular manager, Export Div.

Computer Systems Inc., New York (formerly Mid-Century Instrumatic Corp.), promoted **Raymond W. Carney** from production manager to vice president-manufacturing; **Charles B. Husick** from manager to vice president-engineering and systems development. **Henry Zaron**, a department chief, was named vice president-operations and facilities.

Aluminum Co. of America, Pittsburgh, appointed three assistant general purchasing agents: **L. B. Neubert**, **G. O. Pratt**, and **Roger C. Sharp**.

O. S. Perkins was made chief engineer, **Arthur Krause** general manager of **Hydraulic Machinery Co.**, Waukesha, Wis.

W. L. Hoffee succeeds **Thomas F. Baker** who retires as manager,

RUDY B. VOGT

VICTOR W. SICKING

E. W. Buschman executives

FRANS BROUWER

ED L. McDONALD

Stewart-Warner Electronics products managers

Service-Sales Dept., **Heyl & Patterson Inc.**, Pittsburgh.

Rudy B. Vogt was elected president, **E. W. Buschman Co.**, Cincinnati, succeeding the late **E. W. Buschman. Victor W. Sicking** was elected executive vice president. **Norman J. Tillar,** former secretary, was elected secretary-treasurer. Mr. Vogt was vice president-development and sales. Mr. Sicking was vice president-estimating and sales.

Raymond T. O'Keefe Jr., executive vice president and treasurer, **Kropp Forge Co.**, Chicago, was elected chairman to succeed **Roy A. Kropp,** retired.

Eugene A. March was made assistant works manager at the Midland, Pa., plant of **Crucible Steel Co. of America. John A. Wagg** was made sales manager at the Spring Div., Pittsburgh. **Guy F. McCracken,** chief control metallurgist at Midland, succeeds Mr. March as division superintendent of technical services there. Mr. Wagg was product sales manager of R. D. Werner Co., New York.

H. P. Kibbey, executive vice president, was elected president of **Gate City Steel Inc.**, Omaha, Nebr., to succeed **N. R. Knox,** now chairman. **Rolla A. Smith,** currently vice president, was elected to the new post of vice president-operations and warehouse sales for the Boise, Idaho, and Omaha plants.

Union Drawn Steel Div., Republic Steel Corp., appointed **James W. Hauger** to succeed **David W. McDowell,** retired, as field metallurgist-Chicago area; and **Louis F. Rosing Jr.** to succeed Mr. Hauger as plant metallurgist, Gary, Ind.

John H. Frye was elected vice president, Bar Div.; **E. Joseph Miller** vice president, Tube Div., **Columbia Steel & Shafting Co.**, Carnegie, Pa., both newly created posts. Mr. Frye was sales manager-Bar Div. and Mr. Miller was manager of tubing sales.

In the Industrial Electronics Div., **Stewart-Warner Electronics,** Chicago, **Frans Brouwer** was made manager-new products development; **Ed L. McDonald** manager-new products marketing. Both were with Canadian Westinghouse Co. Ltd., Hamilton, Ont.

William G. Burket was appointed chief engineer, truck tire design, **Goodyear Tire & Rubber Co.**, Akron, replacing **J. E. McCarty,** retired.

In **Jones & Laughlin Steel Corp.'s** Engineering Dept., Pittsburgh Works, **R. S. Somogye** was made chief design engineer to succeed **H. C. Ledebur,** resigned. **J. F. Keefe** was made development engineer at the works.

Alfred C. Wenzel was named market development manager, **Republic Flow Meters Co.**, Chicago, subsidiary of Rockwell Mfg. Co.

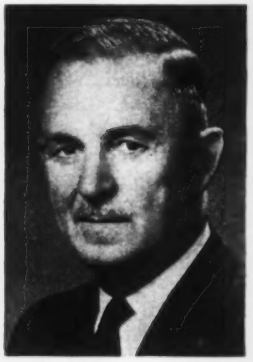
Gerald A. Hill was made district sales manager, midwestern states

EUGENE A. MARCH

JOHN A. WAGG

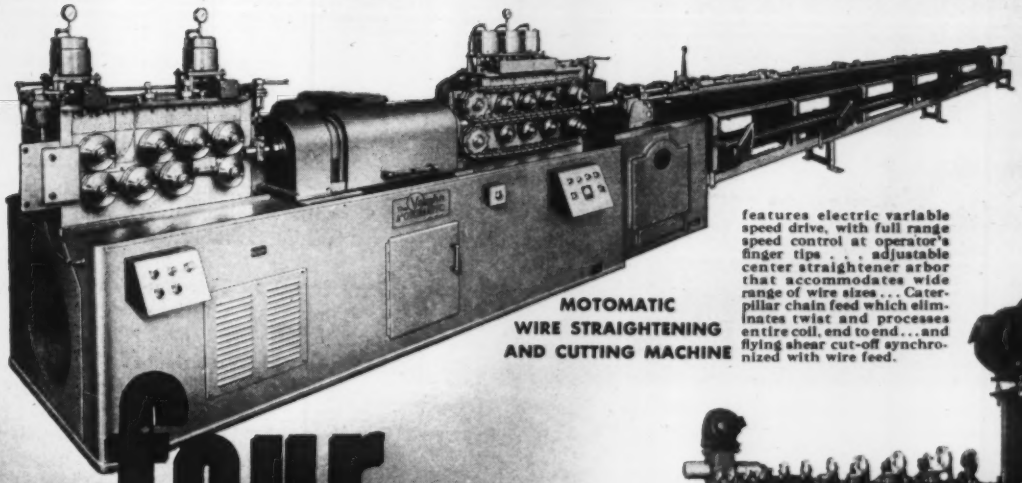
Crucible Steel division posts

JOHN H. FRYE



E. JOSEPH MILLER

Columbia Steel & Shafting vice presidents



MOTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE

features electric variable speed drive, with full range speed control at operator's finger tips . . . adjustable center straightener arbor that accommodates a wide range of wire sizes . . . Caterpillar chain feed which eliminates twist and processes entire coil, end to end . . . and flying shear cut-off synchronized with wire feed.

four NEW VAUGHN PRODUCTS

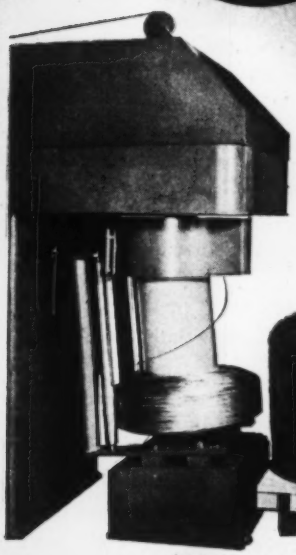
TO MEET THE WIRE INDUSTRY'S DEMANDS

- *for high speed, heavyweight coils . . .*
- *for wire laid in pay-off packs . . .*
- *for straight, precision-cut length wire . . .*

MULTI-PAK UNIT (20 strand)

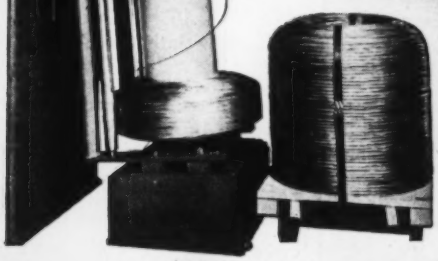
for faster, more efficient laying of wire in pay-off packs, drums or pails

MOD Vaughn EQUIPMENT

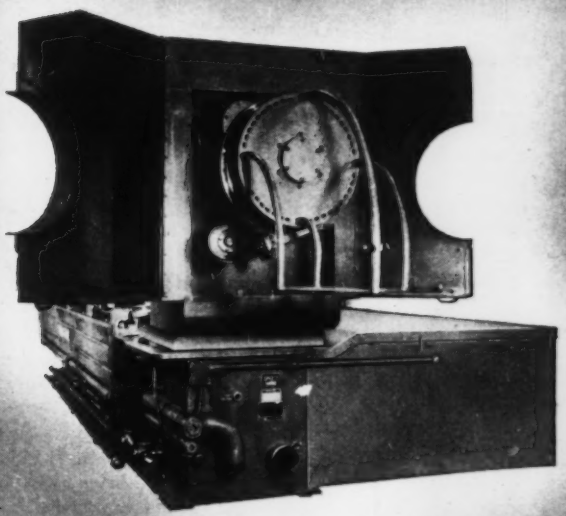


STATIONARY BLOCKS

for drawing and/or coiling to provide heavy weight compact coils. Available in either horizontal or inverted vertical designs.
16½ Gauge Galvanized Low Carbon Wire • Coil Weight—1611# Coil I.D.—14" • Coil O.D.—29" Coil Height—29"



Large Size Wire Bundle made on Stationary Block



STATIONARY DRAWING BLOCK CONVERSION UNIT

which can be substituted for conventional finishing block on existing MOTOBLOX, to provide continuous drawing of heavy weight coils at high speed.

The VAUGHN MACHINERY COMPANY

CUYAHOGA FALLS, OHIO

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys

JOSEPH P. STROZ
SC&H chief engineer

ROBERT L. CLEVELAND
Tonawanda Iron president

GEORGE B. HUTCHINSON
Armco Drainage post

STANLEY M. KAPLAN
M. S. Kaplan president

EMIL H. BERGES JR.
Abbot Ball marketing

JACK W. ROSS
Clark Equipment sales post

area, for **Clemson Bros. Inc.**, Middletown, N. Y.

Stanley M. Kaplan, vice president, was elected president of **M. S. Kaplan Co.**, Chicago. He succeeds his brother, **Bert**, who retires from the presidency but remains active in the firm.

Emil H. Berges Jr. was named marketing manager, **Abbott Ball Co.**, West Hartford, Conn.

John P. Strand, former division superintendent-titanium at the Midland, Pa., Works of **Crucible Steel Co. of America**, was made assistant director, Technical Div., in the company's Technology Dept., responsible for product development sections.

Herbert Fleck, for several years purchasing agent and controller of **Cromwell Paper Co.**, was named vice president-production for both the Chicago and Trenton, N. J., plants. He has headquarters in Chicago.

Jack W. Ross was made manager of primary metals industries sales, Industrial Truck Div., **Clark Equipment Co.** His headquarters are in Chicago.

Ray A. Davies was appointed sales manager, **Chester Hoist Div.**, National Screw & Mfg. Co., at Lisbon, Ohio. He succeeds **Raymond C. Blair**, retired.

Misco Precision Casting Co., with plants in Whitehall and Muskegon, Mich., established a special division to serve the general industrial investment castings market. Heading up the Industrial Div., **Richard W. Arter** was made industrial sales manager, **Harold J. Beauregard** plant superintendent, **James C. Hall** chief engineer, and **William Warren** quality supervisor.

Dr. John C. McGregor, president, **Narda Ultrasonics Corp.**, Westbury, N. Y., assumes full operating as well as policy direction, following termination of services of **Paul M. Platzman**, executive vice president.

Joseph P. Stroz was appointed chief engineer, **Strong, Carlisle & Hammond**, Conneaut, Ohio, a division of White Sewing Machine Corp. His post is newly created as part of a general product diversification program. He has been with the Special Products Div. of White Sewing Machine.

Robert L. Cleveland was appointed president, **Tonawanda Iron Div.**, North Tonawanda, N. Y., American Radiator & Standard Sanitary Corp. He has served as general manager since November, 1958, following retirement of its former president, **L. A. Merryman.**

George B. Hutchinson was appointed manager of production engineering on the Middletown, Ohio, headquarters staff of **Armco Drainage & Metal Products Inc.**, subsidiary of Armco Steel Corp. Mr. Hutchinson was supervisor-production engineering.

Raymond C. Geiger was made manager of manufacturing control at the Maryland Div. of **Litton Industries.** He was operations manager at AMF Atomics Div., American Machine & Foundry Co.

Randolph H. Jackson was appointed vice president-sales, **Boston Woven Hose & Rubber Div.**, American Biltrite Rubber Co., Cambridge, Mass. He was sales director.

OBITUARIES...

Louis Cates, 77, chairman, **Phelps Dodge Corp.**, New York, died Oct. 29.

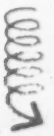
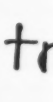
H. W. Prentis Jr., 75, chairman, **Armstrong Cork Co.**, Lancaster, Pa., died Oct. 29.

Ross M. Foltz, 63, a vice president, **Ladish Co.**, Milwaukee, died Oct. 26.

J. Chester Bath, 67, vice president-treasurer, **John Bath & Co. Inc.**, Worcester, Mass., died Oct. 19.

Carlyle J. Wartell, 53, superintendent, **Letraw Mfg. Co.**, Skokie, Ill., died Oct. 24.

Carl B. Pollock, 64, vice president-manufacturing planning and policy, **Allegheny Ludlum Steel Corp.**, Pittsburgh, died Oct. 31.

If it rolls on an axle or turns in a bearing or rides on a shaft if it slides in a groove or moves on a pivot if it bores  or cuts  or transmits pressure one of Sinclair's 500 specialized lubricants is designed to make it work better. For answers to your lubrication problems, write today to

SINCLAIR REFINING COMPANY

Technical Service Division
600 Fifth Ave., N.Y. 20 N.Y.

Sinclair

Automatic Transmission Manufacturer Specifies

Annealing furnace at the Shelby mill. Ostuco tubing can be bright or soft annealed, stress relieved, normalized or heat treated.

"As a leading producer of quality transmission components, we can't leave anything to chance. Our design requirements, materials specifications and manufacturing processes are under the most stringent quality control standards. And we demand as much of our vendors.

"One sure way we have found to eliminate the unpredictable is to specify Ostuco Seamless Tubing. We know from experience we can rely on the precision annealing and unvarying quality of Ostuco tubing that slashes reject rates, helps us produce parts in quantity for profit . . ."

If you want to eliminate the unpredictable in your own plant, then it's time you called your local Ohio Seamless representative. He's listed in the Yellow Pages. Or contact the plant at *Shelby, Ohio —Birthplace of the Seamless Steel Tube Industry in America.*

AA-9604

OSTUCO TUBING

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company • SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Los Angeles (Lynwood), Miami, Moline, New Orleans (Chalmette), New York, North Kansas City, Philadelphia (Wynnewood), Pittsburgh, Rochester, St. Louis, St. Paul, Salt Lake City, Seattle, Tulsa, Wichita CANADA: Railway & Power Engr. Corp., Ltd. EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

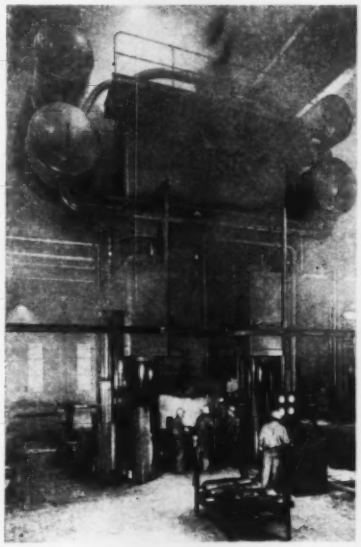
Kaiser Doubles Capacity Of Contract Forging Plant

CAPACITY of the Forging Div., Kaiser Aluminum & Chemical Corp., Erie, Pa., has been doubled through a $5 million plant expansion. Facilities housed in a new 53,000 sq ft building permit the division to handle a wide variety of nonferrous contract forging work and to increase its output of aluminum alloy forgings.

New equipment includes three large E. W. Bliss Co. water-accumulator hydraulic presses, two smaller oil hydraulic trimming presses, and five forging preheat furnaces. The three large presses have capacities of 3000, 5000, and 8000 tons.

Of prime importance to Kaiser is flexibility of equipment. The hydraulic forging presses are used for both hand forging and closed die work on a variety of operations that range from cogging to single stroke forging of large, complex shapes.

A major portion of current production is destined for the aircraft and missile fields, for transportation applications, and ordnance. Special purpose forgings and gun mounts also are being made in the Erie plant. Many of the forgings are shapes which require greater precision and closer tolerances than were possible before installation of the hydraulic presses.



Equipped with side cylinders for preforming stock, this 8000 ton press at Kaiser Aluminum & Chemical Corp.'s Forging Div. at Erie, Pa., can be used on split die work for undercut forgings. It's designed for eccentric or off-center loading so that it can handle asymmetric parts

Iron Fireman Expanding

Iron Fireman Mfg. Co. of Canada Ltd., Toronto, Ont., plans to double its plant floor space in the next two years. The company is a subsidiary of Iron Fireman Mfg. Co., Cleveland.

Navy to Build Drydock

The Navy's largest drydock is being constructed at Puget Sound, Wash. It will provide facilities on the West Coast to service the largest fleet units that are in service or contemplated. The Carrier Repair Site will be completed in 1961. It will be 1180 ft long, 180 ft wide at the coping, and 61 ft deep.

Will Build Machine Shop

Dayton Steel Foundry Co., Dayton, Ohio, plans to construct and equip a new machine shop at a cost of $750,000. This project is in addition to the $250,000 expansion program disclosed earlier.

Shifts Appliance Output

Murray Corp. of America, Detroit, is streamlining and expanding the manufacturing operations of its Easy Laundry Appliances Div., Chicago. Final assembly operations of the division's washer-dryer are being shifted from the Syracuse, N. Y., plant to Scranton where the majority of components for these units are manufactured. The consolidation at Scranton will free the Syracuse plant facilities for increased production of automatic washers, electric and gas dryers, wringer washers, and Spindriers. The Scranton plant will continue to manufacture steel plumbing fixtures and cabinets for Murray's Eljer Div.

Installs Birdsboro Shear

Pittsburgh Steel Co., Pittsburgh, has installed an 18 in. billet flying shear at its Monessen, Pa., plant. The shear was engineered and built by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa. It is designed to handle billets up to 2½ in. square.

Forms Anchor Alloys Inc.

Anchor Alloys Inc. has been organized as an affiliate of Anchor Metals Inc., Brooklyn, N. Y. The new concern has established headquarters at 968 Meeker Ave., that city, and will specialize in the precious alloys required in the manufacture of electronic semiconductors.

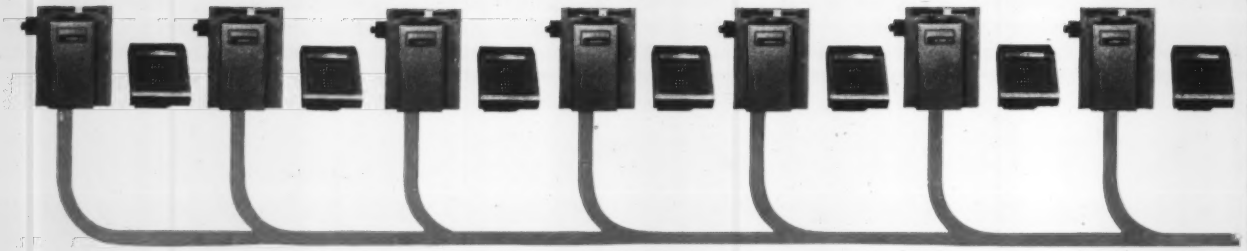
Louis Allis Broadens R&D

Louis Allis Co., Milwaukee, is constructing a research and development center in Greendale, Wis. The building will double the size of the present engineering and physics laboratories. The company makes electric motors, generators, and adjustable speed drives. Its research and development plans include electronic and nuclear areas which will permit deeper penetration into industrial and military fields.

Budd Forms Tatnall Div.

Budd Co., Philadelphia, has changed the status of Tatnall Measuring Systems Co. from a subsidiary to a division. Management of the division will continue under the direction of Dr. J. H. Buck, newly appointed vice president and general manager. Frank Tatnall is vice president of the division in charge of sales development. The division maintains headquarters in Phoenixville, Pa., and recently expanded its plant capacity by leasing 10,000 sq

(*Please turn to Page* 140)



IBM® bridges the gap between factory source and management action...

IBM 357 DATA COLLECTION SYSTEM

Production line data must be "live" to be of use in management decisions. The new IBM 357 Data Collection System now makes this information available as soon as it occurs . . . in readily usable punched card form. The IBM 357 increases the volume and speed of data flowing from production line to management, yet drastically reduces the amount of paper work involved.

Each central receiving station of an IBM 357 System is served by up to 20 compact, wall-mounted input stations, strategically located near work areas to receive factory data directly from the production line. Facts fed into the input station are flashed to the recording center and automatically punched into IBM cards, ready for immediate processing. The IBM 357 System is compact, economical, flexible. It can be expanded or modified at any time to handle changing needs.

What Automatic Data Collection with the IBM 357 System can mean to:

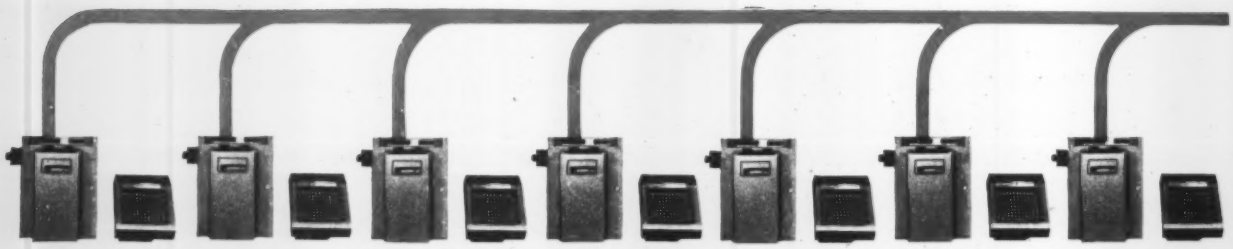
MANAGEMENT—Improved operating control based on timely, valid production facts

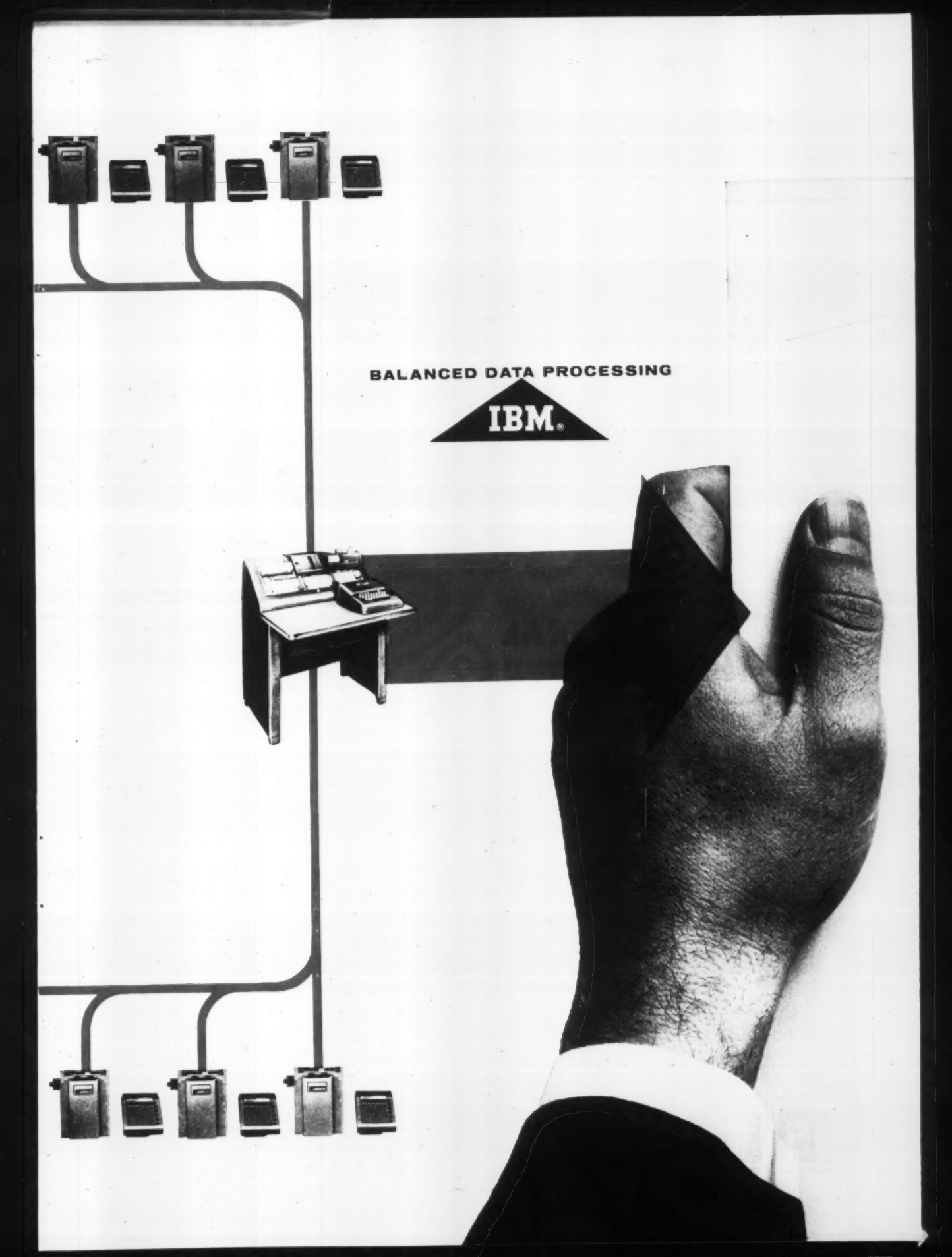
PRODUCTION—More efficient scheduling, based on knowledge of exact production status • Simplified time and job record processing

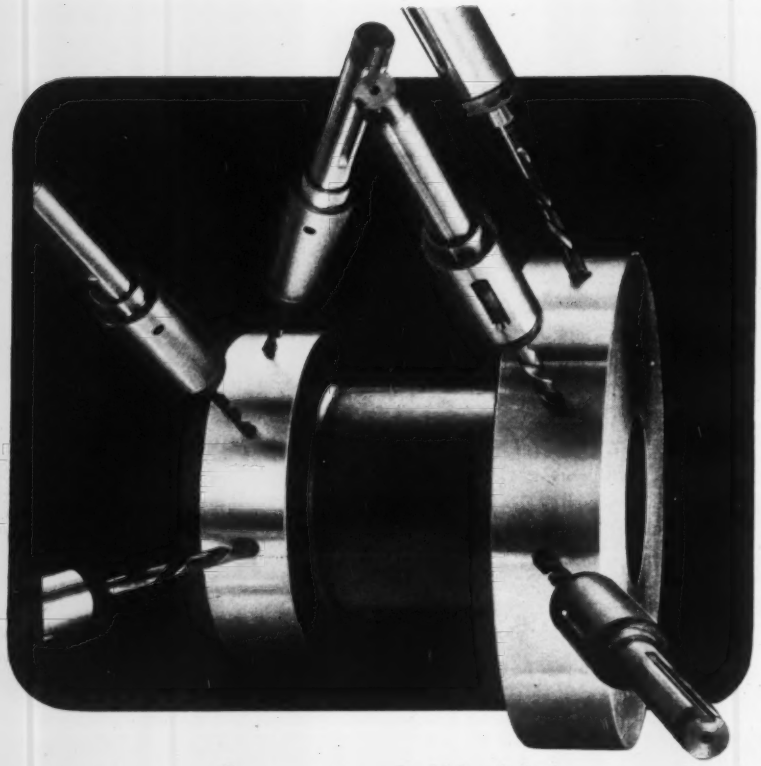
INVENTORY—Closer control of stock due to timely reporting of shortages, overproduction and scrap

MAINTENANCE—Up-to-the-minute record of machine status • Faster schedule adjustments • Immediate location of service personnel

Your local IBM representative can tell you about the many advantages of the new IBM 357 . . . call him today. IBM 357 Data Collection System, like all IBM data processing equipment, may be purchased or leased.



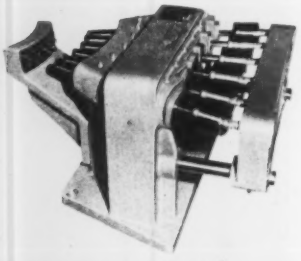

BALANCED DATA PROCESSING
IBM.



Can you drill this
PERIPHERAL HOLE-PATTERN
at a profit?

U.S. Drill Head engineers can show you the cost-reducing way to do these tough jobs—just as they did for a missile manufacturer, producers of automotive parts, diesel engines, and in many other industries.

New products of the space age continually bring new manufacturing problems. Take advantage of U.S. Drill Head Co.'s leadership in applying multiple drilling and tapping heads to your drilling operations.



U.S. Fan-Shaped Heads for peripheral drilling — full ball bearing shaft mounting, shaved gears, super-finish spindles, full torque, maintained precision.

US DRILL HEAD

Adjustable and Fixed Center Multiple Drilling Heads.
Individual Lead Screw Multiple Tapping Heads.

UNITED STATES DRILL HEAD CO.

BURNS STREET • CINCINNATI 4, OHIO

(*Concluded from Page* 137)

ft of manufacturing floor space in a building in nearby Royersford, Pa.

Plans New R&D Center

Westinghouse Electric Corp. plans to create a centralized research and development center in Churchill Borough, 10 miles from downtown Pittsburgh. The center will bring together all key personnel associated with the company's broad centralized program of basic and applied research. Ground will be broken early next year for two buildings; full occupancy is scheduled for 1961.

Formsprag Broadens Line

Formsprag Co., Warren (Detroit), Mich., purchased the Rawson Div. of O. S. Walker Co., Worcester, Mass. The centrifugal clutch manufacturing operation has been transferred to the Warren plant.

Kaiser Enlarges Facilities

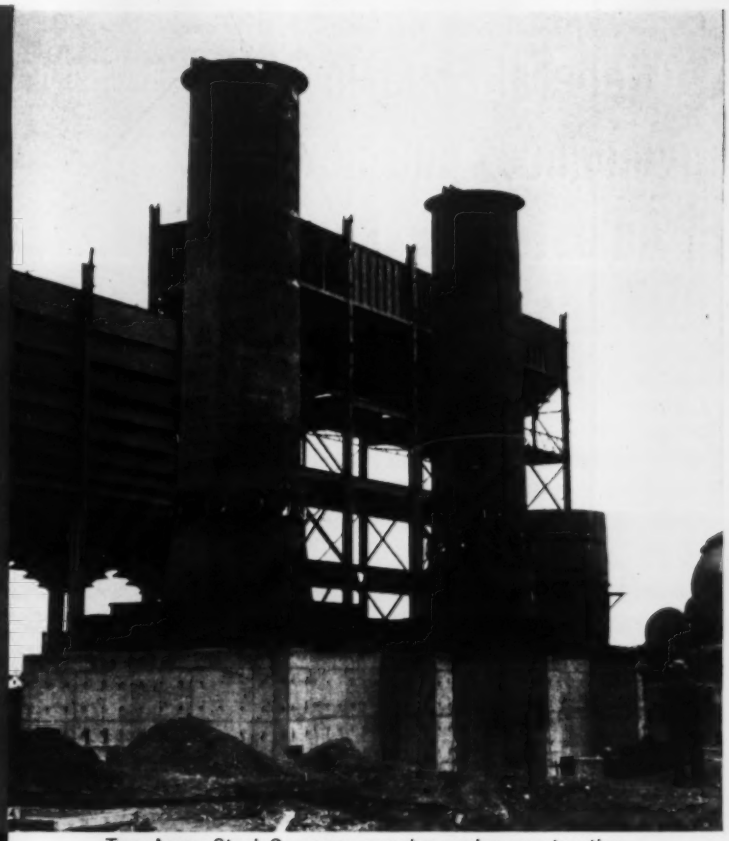
Kaiser Aluminum & Chemical Corp., Oakland, Calif., has installed two refining cells at its Mead (Wash.) Works for production of superpurity aluminum (99.99 plus per cent). The new cells triple Kaiser's capacity for this product to more than 1 million lb annually. Major applications include petroleum catalysts for producing high octane gasoline, foil for electrical capacitors, and decoration (automobiles, appliances, and costume jewelry).

The company also has placed in operation a two-high bright strip mill at its Ravenswood, W. Va., plant. Output of the mill is highly polished aluminum coil in widths up to 36 in. and in gages 1/16 in. or less. It can effect a 0.0005 in. reduction on 0.010 to 0.006 gage stock.

Vitro Consolidates Unit

Vitro Corp. of America, New York, organized a subsidiary, Vitro Chemical Co. The new firm consolidates the chemical and metallurgical operations in the U. S., including those conducted by Vitro Uranium Co., Salt Lake City, Utah; Heavy Minerals Co., Chattanooga, Tenn.; and Vitro Rare Metals Co., Canonsburg, Pa. William B. Hall

World's largest cupolas at Acme Steel Company use...



Two Acme Steel Company cupolas under construction.

Photo illustrates a temporary sub-assembly following machining of a section of the three-block-high "National" carbon well zone lining.

NATIONAL
TRADE-MARK

CARBON LININGS

These two cupolas will provide hot metal for Acme Steel Company's new oxygen converter plant at Riverdale, Illinois. Both of these cupolas measure 13 feet at the base plate and each will accommodate a 40-foot column of raw materials as compared to the 25 feet of a typical cupola.

These carbon linings — because of their chemical resistance and physical stability at high temperatures — permit extended campaigns without shutdown for lining repairs. This affords saving in maintenance materials and labor while maintaining production.

Here again is an outstanding example of the trend to carbon in cupola linings. Its resistance to attack from either acid or basic slag, low co-efficient of thermal expansion, and high strength at elevated temperatures make "National" carbon an ideal material for lining cupola wells, breast areas, front slagging spouts and slag dams.

"National" and "Union Carbide" are registered trade-marks of Union Carbide Corporation

UNION CARBIDE

NATIONAL CARBON COMPANY • **Division of Union Carbide Corporation** • ***30 East 42nd Street, New York 17, N. Y.***

OFFICES: Birmingham, Chicago, Houston, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA:** Union Carbide Canada Limited, Toronto

General Electric announces the new Adjust-O-Breaker toolholder!

Carboloy® toolholder with adjustable chipbreaker lets you adjust from any angle . . . offers any desired adjustment within its range* . . . features "floating" indexable chipbreaker with absolute repeatability.

MORE jobs with *LESS* tooling—that's what you get with this new Carboloy® Adjust-O-Breaker toolholder! No need to have a separate chipbreaker for every cutting job. No need to restrict yourself to toolholders with only two or three chipbreaker settings. Now you can have this versatile new Carboloy toolholder . . . and *adjust it for any chipbreaker setting within its range.**

Available right now from stock in 5 styles, negative rake, for left- and right-hand machining, the Adjust-O-Breaker truly brings new meaning to disposable tooling.

So, to get cutting tool versatility that lets you handle *more* jobs with *less* tooling, check into the complete Carboloy line—Lift-O-Matic (positive rake, negative rake, and tracer), heavy-duty, and the new Adjust-O-Breaker toolholder. The complete line of Carboloy inserts, insert seats, convertible seats, and brazed tooling is the *broadest* in the industry . . . designed to meet *every* tooling need to give you BETTER PROFITS THROUGH BETTER TOOLING.

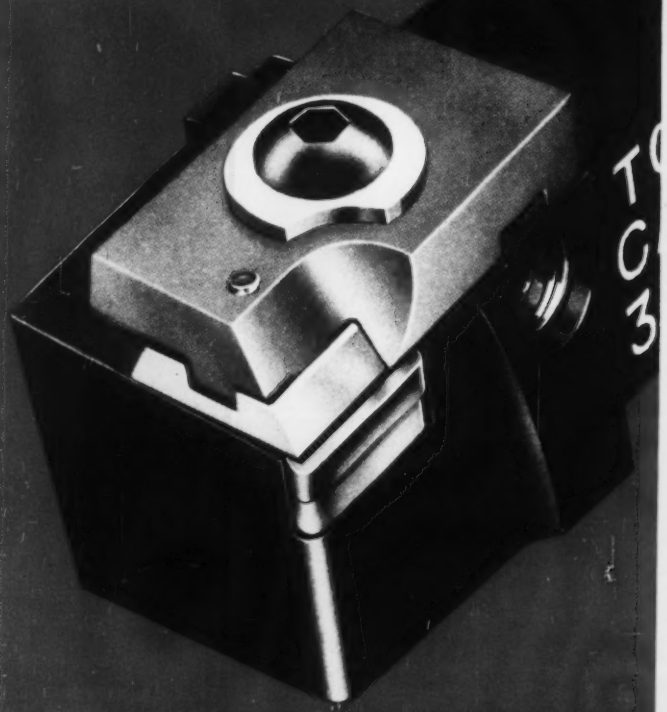
See your Authorized Carboloy Distributor now. He's listed in the Yellow Pages. *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Road, Detroit 32, Michigan.*

CARBOLOY
CEMENTED CARBIDES

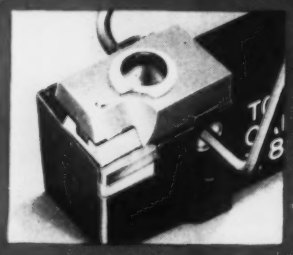
METALLURGICAL PRODUCTS DEPARTMENT
GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES
MAN-MADE DIAMONDS • MAGNETIC MATERIALS
THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

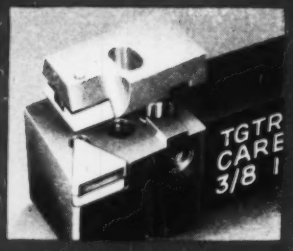
Metallurgical Memo from General Electric



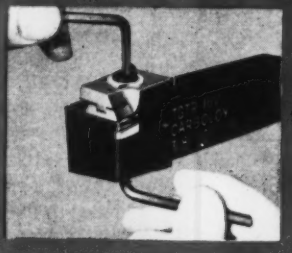
*Sizes 16V and 85V: adjustable range 1/16" to 3/8"
Size 20V: adjustable range 1/16" to 11/16"



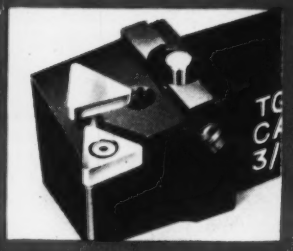
1. Chipbreaker setting adjusts to any width within range.* Set screw with two open ends provides access from either side. No springs to adjust.



2. Design permits absolute repeatability of settings. Floating chipbreaker is indexable. Can't drop out when clamp is loosened.



3. Clamp screw is accessible from top or bottom; allows easy indexing or replacement even when toolholder is vertical or upside down.



4. Standard disposable inserts, Carboloy insert seats and convertible seat are used with toolholder. Insert seats are indexable and self-aligning.

is president of Vitro Chemical which is engaged in the milling of uranium ores; production of thorium, rare earth chemicals, rare metals and metal alloys, and industrial chemicals; and chemical and metallurgical research and development.

Fabricates Structurals

Toledo Iron & Steel Co., Toledo, Ohio, has expanded facilities to include structural steel fabrication. Donald L. Williams has been appointed manager of fabrication.

ASSOCIATIONS

Midwest Job Galvanizers Association Inc., Chicago, elected these officers: President, F. C. Brightly Jr., Brightly Galvanized Products Inc., Cicero, Ill.; vice president, M. M. Kaupke, Cedar Rapids Galvanizing Co., Cedar Rapids, Iowa; and secretary-treasurer, Frank Soles, Delta-Star Electric Div., H. K. Porter Company Inc., Chicago.

John K. Edmonds has been named assistant executive vice president of the **American Institute of Steel Construction Inc.**, New York.

NEW PLANTS

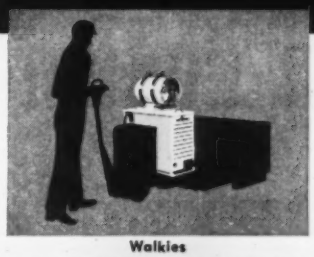
Carpenter Steel Co., Reading, Pa., opened a mill branch warehouse and specialty steel service center at Ft. Washington Industrial Park, Ft. Washington, Pa. Robert A. Kokat is Philadelphia district manager.

Austin Co., Cleveland, is building a 72,000 sq ft plant at Holmdel, N. J., for **Red Bank Div., Bendix Aviation Corp.** The plant represents the first step in a long term development program for the producer of semiconductor products.

K S M Products Inc. is building plant and office facilities in Moorestown, N. J., about four miles from the firm's present headquarters in Merchantville, N. J. The new facilities will be three times the size of the present plant. The company makes studwelding fasteners, equipment, and accessories.

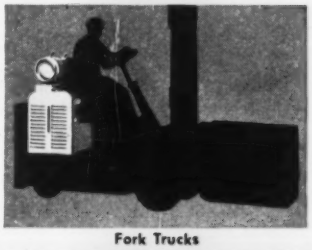
(*Please turn to Page* 146)

Complete Range of Ready-Power Units Cuts Ton-Mile Costs for All Types of Electric Trucks

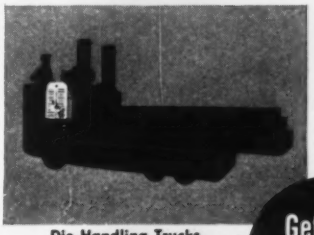


Walkies

Narrow Aisle Trucks



Fork Trucks



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Ready-Power offers a complete range of power units that increase work output and cut ton-mile costs for all makes and models of electric trucks. Ready-Power units generate electric power on demand. They assure full power at all times, for unlimited periods. Truck slowdown is eliminated. Ready-Power units are easily installed on new or used trucks. Return the coupon below for full information.

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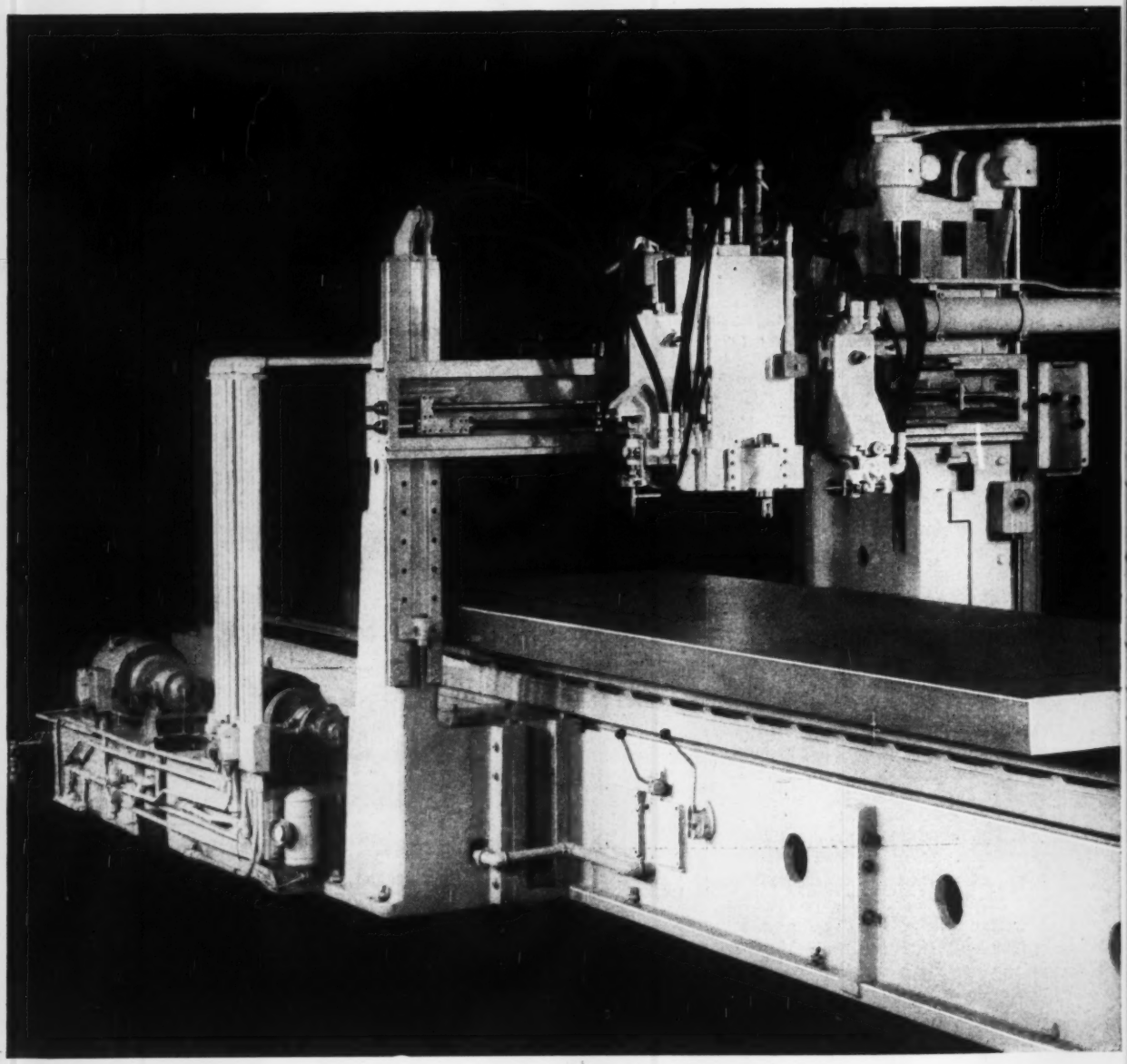

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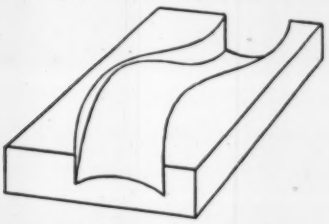
MACHINES COMPLICATED CONCAVE-CONVEX AIRCRAFT PARTS IN ONE-TENTH FORMER PRODUCTION TIME



Actual savings on spar-like aircraft parts*:

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*Complete production facts on request.

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- Maximum metal removal per H.P. expended;
- Low Costs for machining, cutting tools and maintenance.

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STEEL WAREHOUSE "TAKES TO THE AIR"

Fig. 1 — TRAK-RAK fork lift at top of column, lifting bundle of steel rod. Unit serves 3 long aisles of racks.

TRAK-RAK SYSTEM INCREASES STORAGE SPACE, SAVES 22% CAPITAL BUILDING INVESTMENT

When A. C. Leslie & Co. Limited, needed more storage area in its busy Toronto steel warehouse, it decided to "reach for the ceiling" with a Chicago Tramrail TRAK-RAK System of vertical storage and handling. As a result, the company estimates it not only saved 22% of projected capital building costs, but increased the overall efficiency and speed of the Toronto operation. The company expects to gain further economies as the TRAK-RAK system is used to its full extent.

A 5 ton capacity toprunning TRAK-RAK Crane was installed in each of two 40 ft. wide bays to serve specially designed 18 ft. high material storage racks (Fig. 1) Each crane bridge has an overhead trolley, from which is suspended an electrically operated rotating column

Fig. 2 — Carriage equipped with 2 pairs of forks. Operator is flopping outer forks up.

equipped with a special fork lift. All operations of the fork lift, which revolves to serve either side of the aisles, moves toward or away from the racks, and raises or lowers on the column, are controlled by the operator who rides with the carriage.

Two pairs of forks are mounted on the carriage. The outer forks may be flopped back (Fig. 2) leaving the inside forks in position for handling palletized or crated material. For handling long boxes, bars, etc., the outside forks are flipped back into working position.

A TRAK-RAK feature which added to handling speed and insured safe operation was the safety interlock switch system which prevents the column from running

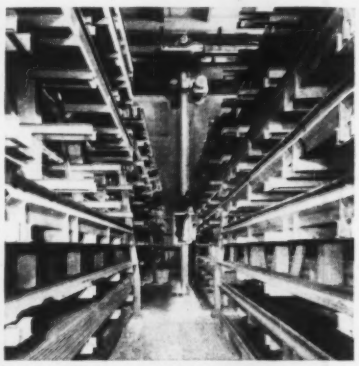


Fig. 3 — TRAK-RAK column requires minimum aisle space for operation.

into a rack and permits full rotation only when the unit is safely beyond the end of the racks.

The A. C. Leslie Company reports that a similar TRAK-RAK System installed in its Montreal warehouse permitted a 37% savings in capital building investment with equally good operating efficiency and economy.

For complete details on the TRAK-RAK System of vertical storage and handling, write the manufacturer:

CHICAGO TRAMRAIL CORPORATION
1326 S. Kostner Avenue • Chicago 23, Ill.

(*Concluded from Page* 143)

Ano-Coil Corp., newly organized, has opened a plant at Rockville, Conn. The firm will make color anodized aluminum strip in coils, formerly available only from West Germany. Marketing of the product is handled by Fromson Orban Sales Corp., New York.

CONSOLIDATIONS

Bohn Aluminum & Brass Corp., Detroit, acquired **Port Everglades Steel Corp.**, Ft. Lauderdale, Fla., principally an importer of steel products used in the building and highway construction industries. Officers of the Bohn subsidiary include Louis Zinn, president, and Allen Gordon, vice president.

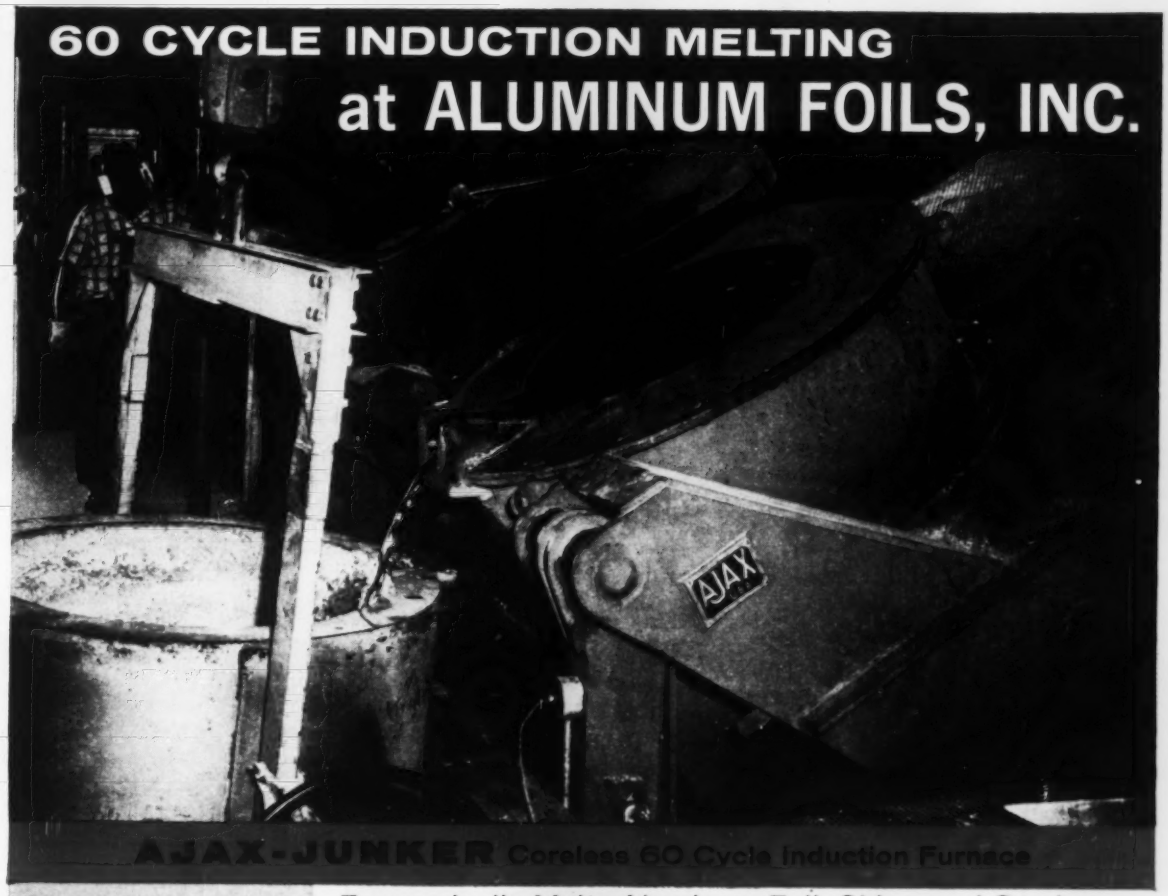
Howe Sound Co., Salt Lake City, Utah, purchased **Sperry Products Inc.**, Danbury, Conn., producer of testing equipment, including ultrasonic systems. The company is also engaged in rail testing services for railroads.

Basic Products Corp., Milwaukee, purchased **Langmar Corp.**, Chicago, producer of vacuum pumps. The pumps will be manufactured by Como-Cast Corp., a Basic Products subsidiary, and will be included in the product line of Hevi-Duty Electric Co., a division of Basic Products.

Directors have approved a plan for merger of **United Industrial Corp.**, Grand Rapids, Mich., with **Topp Industries Corp.**, Los Angeles. Both companies are engaged in research, development, and production for U. S. missile and satellite programs and in the manufacture of a wide variety of products for use by industry and government. If approved by stockholders, the consolidated company will be known as United Industrial Corp.

Directors of **Consolidated Electrodynamics Corp.**, Pasadena, Calif., and **Bell & Howell Co.**, Chicago, have approved a merger proposal. Details of a merger agreement will be developed and submitted to stockholders for approval. CEC produces aviation and missile test equipment, electronic instrumentation and con-

60 CYCLE INDUCTION MELTING at ALUMINUM FOILS, INC.



AJAX-JUNKER Coreless 60 Cycle Induction Furnace

Economically Melts Aluminum Foil, Chips, and Sawings.

The 700 kw AJAX-JUNKER coreless induction furnace at the Jackson, Tenn., plant of ALUMINUM FOILS, INC. — specialists in high-quality aluminum foil, coiled sheet, and super-purity aluminum pig — is the largest unit of its type in operation in this country. With a total capacity of 7000 lbs of aluminum, the furnace is capable of melting 3200 lbs per hour.

The AJAX-JUNKER furnace at this company melts plant scrap consisting of foil, scalper chips, and sawings, materials requiring special attention when using conventional furnaces. With the AJAX-JUNKER furnace and its strong inherent stirring action, no labor is required for 'puddling'. One man controls the entire operation.

Average metal losses are below 2% in this installation where experience with other furnace types showed average losses of over 6%. Accurate temperature control, dependability, and uniformity of alloy composition are further features of this unit. ALUMINUM FOILS are also producing hardener alloys directly from plant scrap with a minimum of effort and a maximum of alloy accuracy.

The AJAX-JUNKER 60 cycle induction furnace is an ideal tool for many different applications, melting ferrous and nonferrous metals. Our engineers will be glad to study your melting requirements. Write to AJAX ENGINEERING DIVISION, Trenton 7, N. J., for Bulletin R 58.

Induction Heating is our ONLY Business

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PATCO also makes extra-long Cold Drawn Carbon, Alloy and Stainless Steel Seamless and Welded Tubing.

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Western Representative For Superior Tube Co.

trol systems, magnetic tape equipment for instrumentation and data processing, and vacuum systems and controls.

Subject to approval of stockholders, **Rheem Mfg. Co.**, Chicago, will acquire **Ruud Mfg. Co.**, Kalamazoo, Mich., producer of water heaters for commercial use.

NEW OFFICES

Beltraco Inc., Kansas City, Mo., opened a branch office at 2645 W. Peterson Ave., Chicago, Ill. The firm is the midwestern representative for S. A. Eteco-Trefileries Leon Bekaert, Zwevegem, Belgium, producer of steel wire.

Joseph Behr & Sons Inc., Rockford, Ill., opened a branch office at 14631 W. McNichols Rd., Detroit 35, Mich. Robert C. Gorman is district manager. The firm is a broker and supplier of ferrous scrap.

NEW ADDRESSES

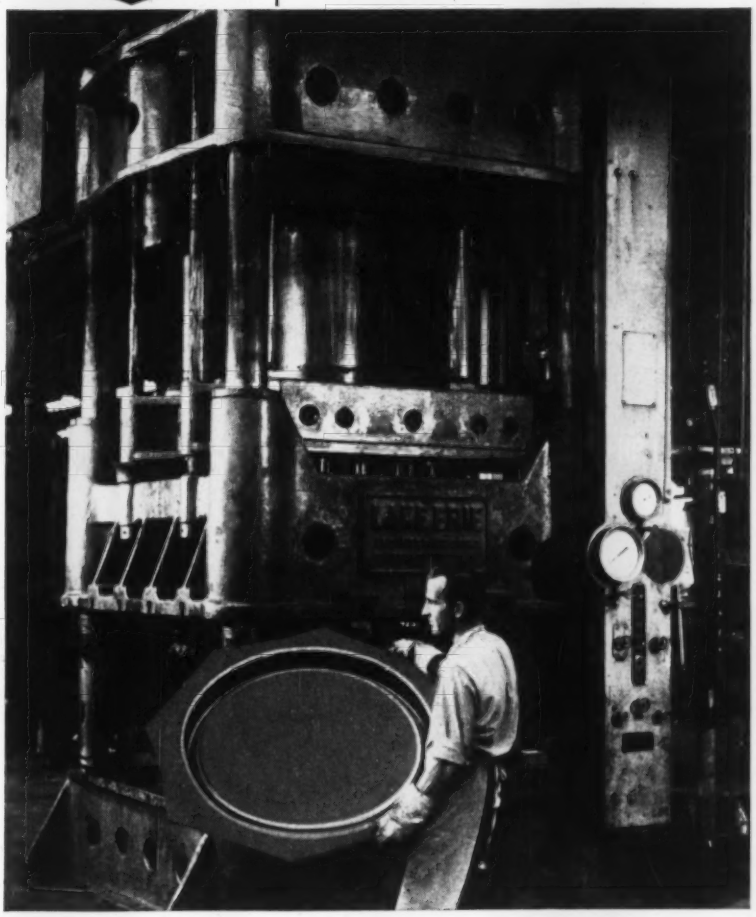
Timken Roller Bearing Co., Canton, Ohio, moved its Pittsburgh branch sales office and warehouse to 2180 Noblestown Rd., that city. The new building contains about 11,000 sq ft of floor space.

Byron Jackson Pumps Inc., Los Angeles, moved its southeastern regional headquarters to 3131 Piedmont Rd., Atlanta 5, Ga. M. E. Youngs is the regional manager.

J. D. Tool & Machine Co. moved to its new plant in Bethayres, Pa. The plant provides double the floor space of the previous Philadelphia plant for production machining and the making of valves and components.

American MonoRail Co. has formally opened its plant at 1111 E. 200th St., Euclid 17, Ohio. Earlier this year, the overhead material handling equipment manufacturer purchased the 130,000 sq ft plant and general offices for $600,000. More than $200,000 was budgeted to prepare the facility for use by MonoRail.

DOW | METAL PRODUCTS



400-TON PRESS draws end pieces of magnesium transmitter housing for missile ground support electronic system. Heated dies make possible one step draws.

The electronic transmitter housing shown in various stages of production on this page is a good example of the type of work carried on at Dow's fabrication plant. It is a large and complex assembly which is produced in quantity, involves many different operations, and must conform to extremely high quality standards.

Large or small jobs. The fabrication plant is a large, well equipped production facility set up to handle large or small jobs, and plenty of both. Its activities encompass every phase of fabrication — deep drawing, bending, spinning, stamping, piercing, machining, arc and spot welding, assembling, chemical treating and painting. The facilities are government certified.

Engineering and quality control. Dow engineers working closely with the customer are frequently able to suggest design modifications which cut costs and/or meet application requirements better. A quality control team using modern methods and equipment assures that high standards of craftsmanship are rigidly maintained.

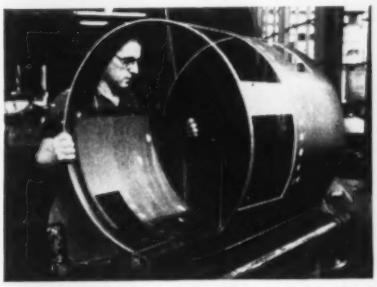
Many "firsts". The fabrication plant has pioneered many developments in the production of magnesium parts and products. They were first to hot draw the lightest structural metal, and first to spot weld and automatically weld it. They have also been a leader in the production use of chemical treatments and finishes for magnesium.

Whatever your requirements, if they involve fabricated Magnesium Aluminum parts or assemblies, it will pay you to make Dow your supplier.

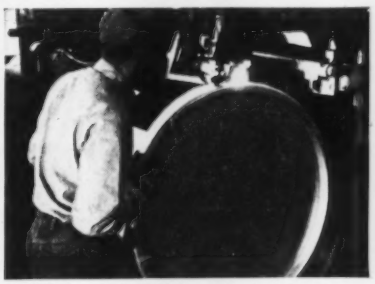
ARE YOU UTILIZING DOW'S EXTENSIVE FABRICATION FACILITIES?

Dow, primary producer of magnesium and its alloys, offers capacity and outstanding capabilities of its Metal Products Fabrication plant.

WRITE TODAY for this illustrated brochure discussing Dow fabrication services. THE DOW METAL PRODUCTS COMPANY, Midland, Michigan, Sales Department 1312LE11-9.



"WRAPPER", or shell of housing is roll formed of magnesium sheet.



AUTOMATIC ARC WELDER, using tungsten-inert gas process, joins end to wrapper.

ASSEMBLY involves attachment of doors, hardware, other components using riveting, bolting, welding.

THE DOW METAL PRODUCTS COMPANY, Midland, Michigan

DIVISION OF THE DOW CHEMICAL COMPANY

R. Hoe reports high machining speeds, consistently smooth

GULF MAKES THINGS

As the world's largest manufacturer of printing press equipment, R. Hoe & Co., Inc., New York, N. Y., does an enormous volume of precision machining. The company operates some 2,100 machine tools at plants in New York City and in Dunellen, New Jersey.

John Penberthy, Plant Maintenance Superintendent, reports that selection of the proper cutting oils for their thousands of machining operations is no small problem. But he quickly explains how they've solved it.

"We consider ourselves experts at printing press design and construction, rather than cutting oil specialists," says Mr. Penberthy. "That's why we have used Gulf engineering service and Gulfcut oils for more than 15 years to help us with our machining problems —especially those involving high speed, high temperature cutting.

"For example, in the high-speed milling of shafts, gears, pinions and other close-tolerance parts for our presses, Gulfcut 41C allows us to machine the pieces faster, without sharply reducing tool life. At the same time it helps us get a smooth finish that eliminates the need for many follow-up grinding operations."

Erection shop at R. Hoe & Co., Inc., where their printing presses are pre-assembled for testing before shipment. One of the new high-speed Hoe presses can print 70,000 newspaper pages per hour—in color.

Under the nameplate that identifies the oldest and biggest name in printing press manufacture are John Penberthy, left, Plant Maintenance Superintendent, and C. J. Ramsey, Gulf Sales Engineer. For their huge volume of precision machining, Hoe has relied on Gulfcut oils and Gulf service for over 15 years.

finishes, using Gulfcut . . .

RUN BETTER!

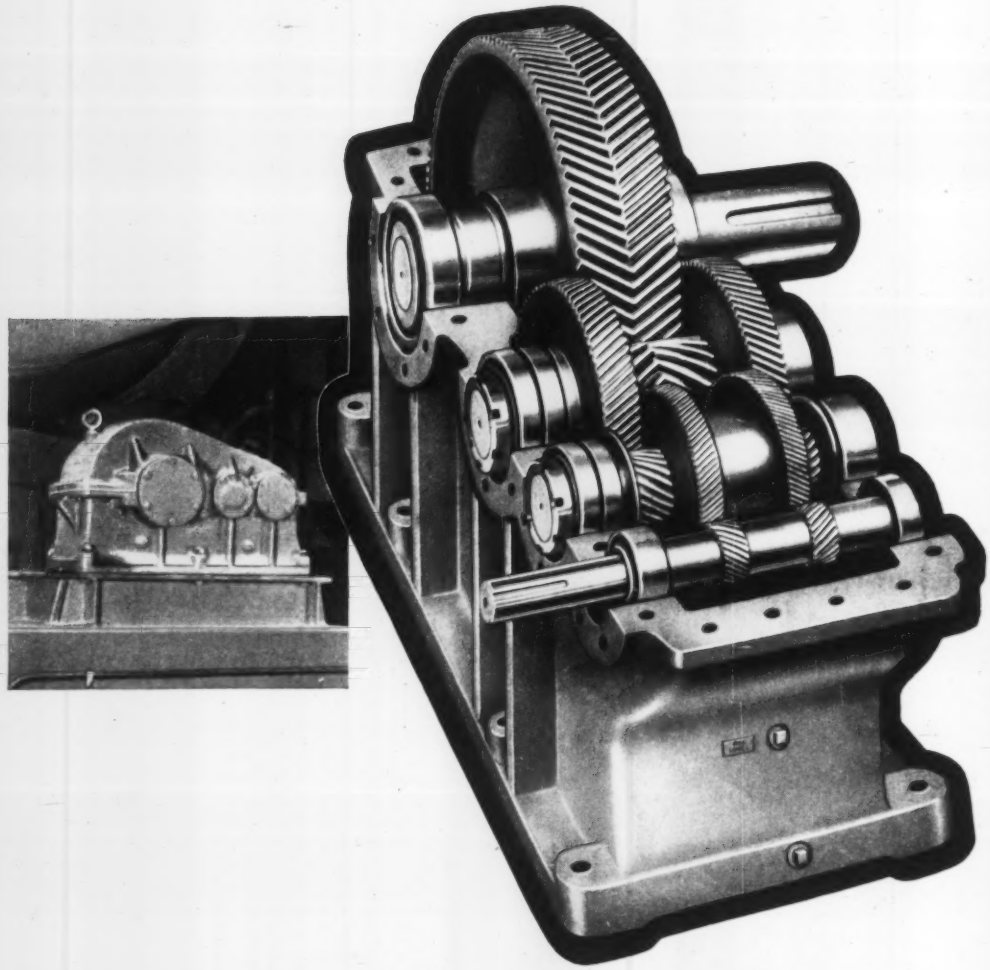
That's just one of many ways in which Gulf makes things run better for R. Hoe & Co., Inc. Perhaps a Gulf Sales Engineer can help improve *your* machining practices, too. Just call the nearest Gulf office.

GULF OIL CORPORATION
Department DM, Gulf Building
Pittsburgh 30, Pa.

GULF

NEW 100-PAGE MANUAL tells all about cutting oil selection and usage. Send for your free copy of "Metal Machining with Cutting Fluids."

SP 9634



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To be specific:

Housings are specially reinforced at points of greatest stress. Extra heavy bearings take shocks and heavy overhung loads in stride. Result: shaft alignment is accurate . . . and it stays accurate. Gears, pinions and bearings last longer.

To meet the specific needs of each application, gearing is specially designed and symmetrically arranged in the housing. Result: the bearings on each shaft carry equal loads, shaft deflections are minimized, bearings and gearing have higher shock load capacity.

Pound for pound, horsepower for horsepower and dollar for dollar, you can't buy a herringbone reducer that will outlast a Philadelphia. They are designed with *your* heavy duty drive problems in mind . . . so that you will never have a drive problem.

Philadelphia Herringbone Reducers are available in single, double and triple reduction for ratios of 1.75:1 to 292:1. Write today for your copy of Catalog H-55.

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Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.

INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

LOOKS AT VACUUM MELTING— Jones & Laughlin Steel Corp.'s Stainless Steel Div., Detroit, is studying a consumable electrode vacuum melting furnace to make vacuum grades of alloy steels. Rumored furnace size: More than 20 in. for handling a 12,000 lb ingot.

REPORT ON EXPLOSIVE FORMING— Suggestions for preliminary forming operations are given in a summary of the work done for the Air Force by Lockheed Aircraft Corp., Burbank, Calif. (PB 151849, OTS, Department of Commerce, Washington 25, D. C., $1.75). Another report covers the compaction of powdered metals in an explosively actuated press at the U. S. Naval Ordnance Test Station, China Lake, Calif. (same source, PB 151844, 50 cents).

NO APPLE FOR THIS TEACHER— A new console-type machine speeds and simplifies the learning process, says the developer, Western Design Div., U. S. Industries Inc., New York. The machine puts information to be learned and exam questions on a screen in front of the student. He indicates the answers by punching buttons. A built-in computer measures accuracy and rate of progress, then adjusts the rate new material is presented to fit the student's ability.

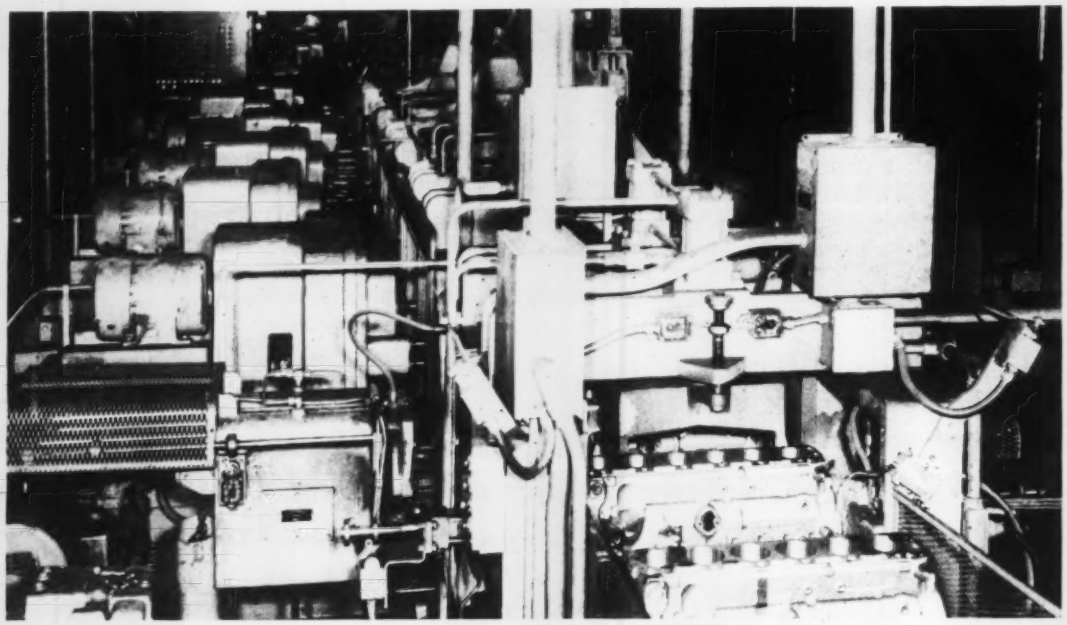
CONTROLLED CORROSION— A new process called anodic passivation stops corrosion caused by such agents as sulfuric acid and caustic soda, claims D. A. Shock, director, Central Research Div., Continental Oil Co., Houston. He says the system forms an extremely thin protective oxide coating over steel, greatly extending the life of metal containers.

COOL CUTTING— Subzero machining is showing up to 500 per cent better results than work at room temperature or conventional turning at Convair Div. of General Dynamics Corp., San Diego, Calif. Liquid carbon dioxide is forced through a small tube that runs along the cutting tool shank up under the tip of the cutting edge. As it's released, the liquid gasifies immediately below the cutting edge, thus cooling the tool and prolonging its life. Object of the investigative program (sponsored by the Air Materiel Command): Reasonable production machining of aircraft superalloys, including L-605, H-11, and A-286.

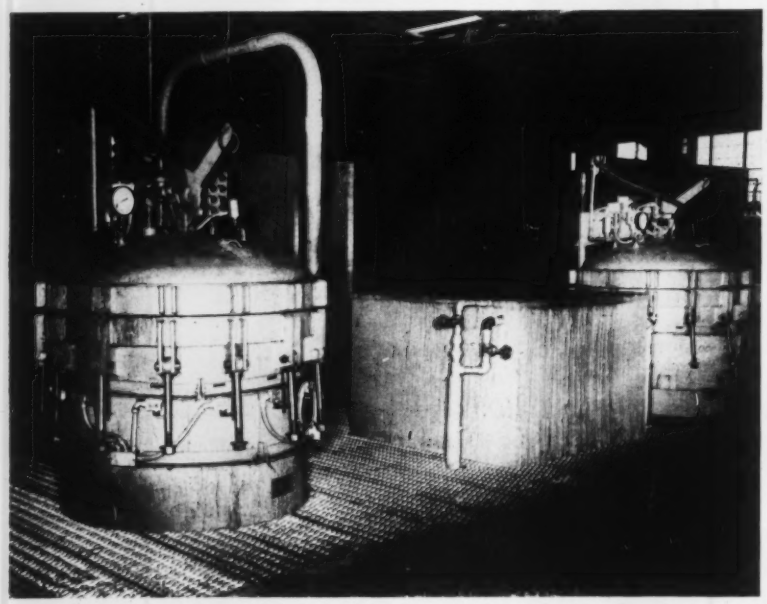
OUTSIZE VACUUM FURNACE— High alloy steels for the Atlas missile will be heat treated in a high vacuum furnace 12 ft long by 9 ft in diameter at Convair Astronautics Div., General Dynamics Corp., San Diego, Calif. It develops vacuums down to ½ micron, temperatures up to 2150° F.

READYMIX CHEMICALS IN SOLID FORM will replace the familiar flakes and powders in paper bags, predicts Pennsalt Chemical Corp., Philadelphia. Advantages: Less bulk, easier handling, cheaper shipping. Coming: Returnable, 50 gallon drums with attached plumbing to permit additions to be made by circulating bath fluids through the drum

Ford's Falcon Engines Are Machined . . .



Reworked transfer machining line saved an estimated 60 to 75 per cent of the equipment cost. It's indicative of efforts to keep down price of compact car



When casting porosity shows up after machining, the parts are put in these autoclaves where pores are impregnated with a waterglass-like substance. In a test run, the process saved 66 out of 76 intake manifolds. Previously, individual fixtures were required for each part to be impregnated

AN automotive engine line in a plant on the outskirts of Lima, Ohio, dramatically illustrates the economies that motivated Ford Motor Co. engineers to adopt the building block concept.

• **Before**—A year ago the line had six machines with 93 stations. It machined V-8 engines for Mercurys, Edsels, and Lincolns.

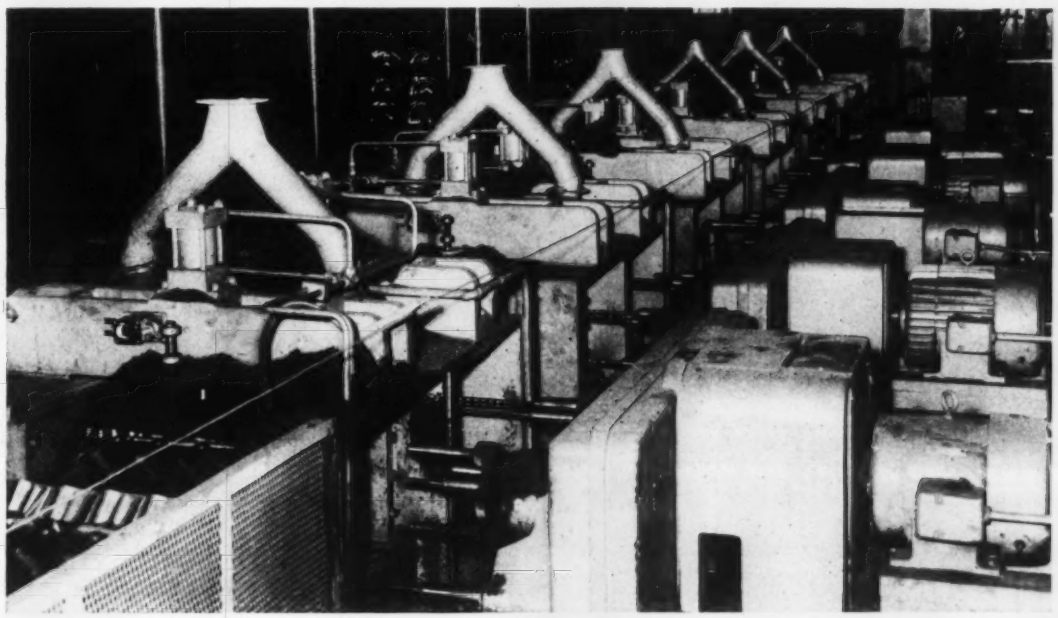
Then the line was torn out, shipped to Buhr Machine Tool Co., Ann Arbor, Mich., where it was completely dismantled, reworked, retooled, and shipped back to Lima.

• **After**—It is now in operation as a four machine, 65 station unit that turns out 1200 Falcon blocks a day.

• **Savings**—The conversion of standard machine bases, columns, and other components into a new combination brought important savings. Lima production men estimate: The investment in the machines runs only 25 to 40 per cent of the cost of new units.

In addition, since most of the line had a full year's seniority in production, only a fraction of the normal startup trouble was encountered.

on a Line That Turned Out V-8s Last Year



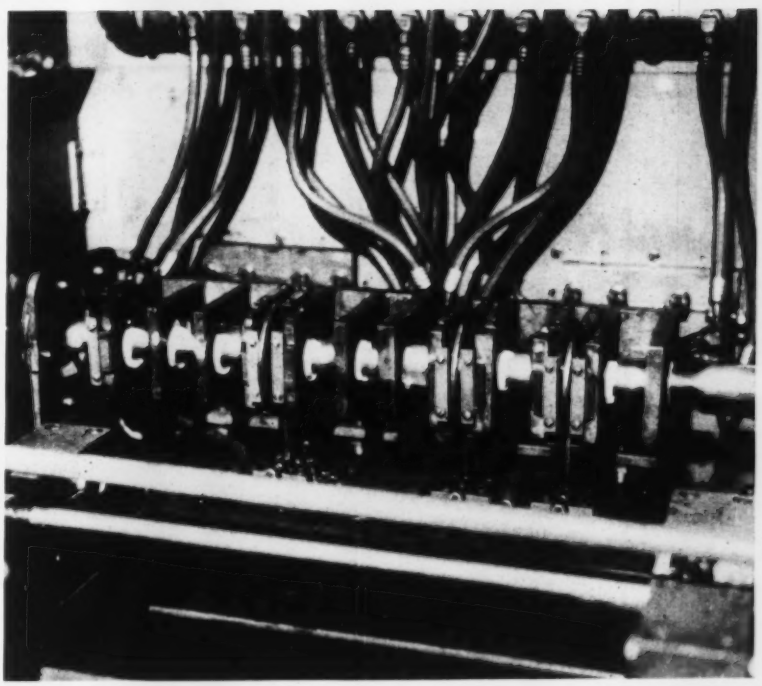
To boost Falcon engine output, a second V-8 line is being rebuilt by another company to meet anticipated increased requirements.

• **The Record**—Performance of the line has been excellent. Manufacturing managers say they are consistently holding some extremely close tolerances. (Specs for some Falcon engine parts call for tighter tolerances than those for bigger engines.)

Manufacturing men consider the Falcon engine one of the best Ford has ever turned out. One told STEEL the engine is a "jewel." On several tests, they have run at high speeds for over 500 continuous hours, nearly double the time that's usually considered satisfactory.

Most handling, machining, and assembly techniques on the line are conventional. Wherever applicable, Ford's titanium carbide cutting tools are being used. They're giving a tool life reported to be nearly double that of conventional carbides.

Two newcomers to the Lima plant: An induction hardening unit that adds life to camshaft lobes and an autoclave department that has improved the efficiency of casting impregnation techniques manyfold.



Machined camshafts are passed into the coils of this Tocco induction hardening unit for 21 seconds. They are then dropped in a 90 second oil quench before being washed. The cam lobes are hardened to 52-54 Rockwell C. Depth of hardness varies from 1/8 in. on the heel to 3/16 in. on the nose

New Anocut electrolytic cavity sinking machine. Work space is at right; drivehead mechanism is at left. Work may be mounted on the table where the vise is shown. Tool electrode is mounted on the face of the ram head within the enclosure

Electrolytic Machining Advances

New unit broadens application of method. It machines straight wall cavities (through or blind holes) at rates up to 0.005 in. a second. Holes can be any shape

GEOMETRIC limitations on electrolytic machining have been lifted by a new tool that sinks cavities of any shape in metals that can scarcely be touched by conventional techniques.

The cavity sinker, developed by Anocut Engineering Co., Chicago, is expected to be used first in the machining of exotic, high strength metals for jet engines and missiles.

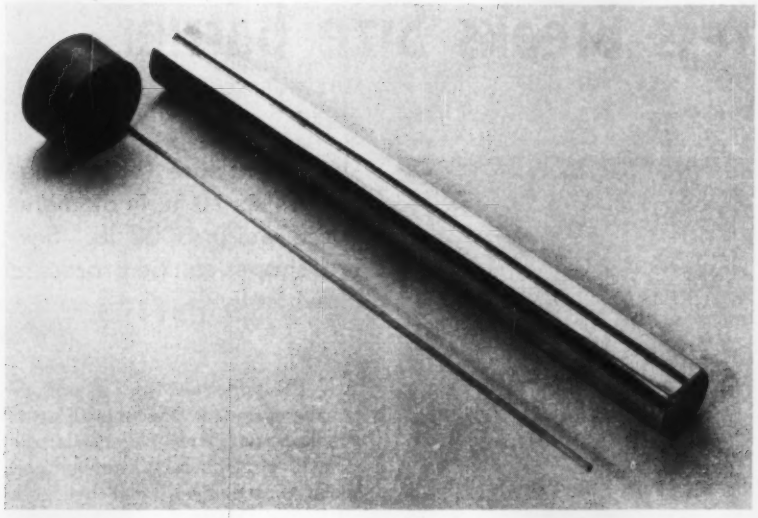
It operates on the same principle as early Anocut tools which used a rotating wheel. The machine sinks irregular holes and shapes, following the contour of an electrode made for the purpose. The nonrotating electrode is simply plunged linearly into the work material.

STEEL editors witnessed this demonstration: A conventional power drill made only a shiny spot in a piece of high speed steel (hardened to 65 Rockwell C). The electrolytic machine penetrated the material at a rate of more than $\frac{1}{4}$ in. a minute.

• Electrolytic metal removal may be likened to the electroplating process operating in reverse.

Material is removed from the work by passing a direct current continuously through a harmless, water-base electrolyte solution, which is between the workpiece (positive) and the electrode (negative).

Since no heat is involved, there



Cavity sinker can machine long, small holes. The hole in the test bar was formed with the tool electrode shown. The bar was then ground away to show straightness and accuracy of the 0.078 in. diameter hole which is 7½ in. long. The material is Udimet 700

can be no metallurgical damage to the work material. No sparks or arcs are generated, and the electrode and tools do not wear or erode.

Lynn A. Williams, president of Anocut, claims it is possible to produce hundreds of cavities with no electrode wear.

• The rate at which metal can be removed depends on the capacity of the power supply unit.

It ranges from 0.030 cu in. per minute with a 300 ampere unit to 0.300 cu in. per minute with a 3000 ampere power supply.

Ordinarily, the removal action can be concentrated in a small work area, permitting high penetration rates. It is generally easy to remove 0.100 cu in. per minute over a work area (electrode area) of 1 sq in. Linear penetration rates range from 0.001 to 0.005 in. per second, depending on the type of work material and the electrode configuration.

It is also possible to mount multiple electrodes so that several pieces may be machined simultaneously. The penetration rate does not decrease as long as the capacity of the power supply unit is not exceeded, explains Mr. Williams.

• On most materials, it is easy to obtain a finish of 30 to 40 microinches.

On superalloys, the finish will be better than 20 microinches. The optimum finish is obtained at maximum removal rates, so that ordinarily only one operation is needed to make a finished piece.

Accuracy and reproducibility depend on the kind of work involved. Under optimum conditions, accuracies of plus or minus 0.0005 in. have been obtained. Normally, expected accuracy is 0.001 to 0.002 in.

Electrolytic cavity sinking is not applicable to nonmetallics.

During development stages, particular attention was given to machining straight wall cavities (both through holes and blind holes) in high speed steels, high tensile alloy steels, and superalloys of the types used in jet engines—Stellite 31, Rene' 41, Udimet 500, Incoloy, Stellite 25, Udimet 700, and similar materials.

• Anocut has adopted a conservative and selective sales policy for the new machines.

It will review drawings or sample parts to determine whether the work can be done to advantage with the cavity sinking process and equipment. If it is feasible, Anocut will propose a tooling contract to design electrodes—either it or the user will make them.

After tests show that the electrode is suited for the application, Anocut will offer its equipment for sale or rent. The company will also quote on the production of limited quantities of parts.

Mr. Williams feels that his sales policy will minimize the risk in buying an unfamiliar piece of equipment. It will also assure that the equipment can be set into productive operation in a user's plant with a minimum of delay.

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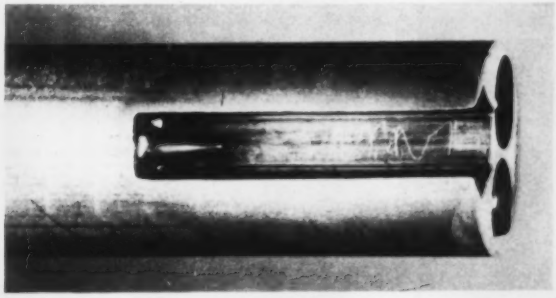
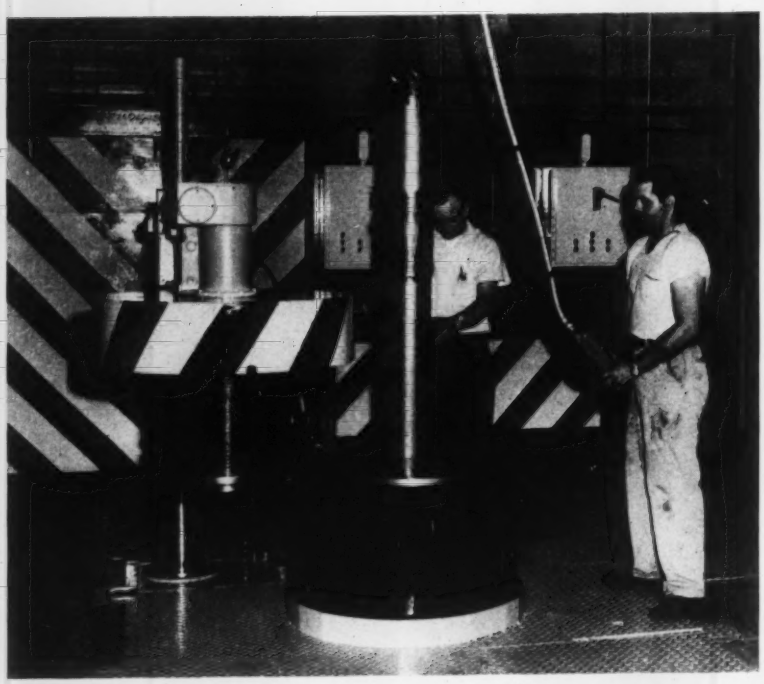


Two examples of what can be done on the machine. At left are integrally formed turbine blades made in a single operation. Material is Udimet 500. At right is test specimen showing hexagonal hole produced with tool electrode breaking through side of piece. Material: Ulimet 700. Finish of 30 to 40 microinches is routine

New Powder Press Breaks Size Barrier



Powder to form a billet of tungsten is lowered into new press. Much of the press body is below floor level

Original experimental press made smaller billets of various shapes

Water pressure forms tungsten billets 10 in. in diameter which weigh 3000 lb. Several shapes can be processed individually

WATER is the ram for a new metal powder press at Sylvania Electric Products Inc., Towanda, Pa., a subsidiary of General Telephone & Electronics Corp. The hydraulic unit shows promise of producing larger and more complex shapes made of such materials as tungsten and molybdenum, says P. W. Felten, chief engineer of the Chemical & Metallurgical Div.

The new press can produce a tungsten billet 10 in. in diameter and 4 ft long, weighing 3000 lb, or a similar size molybdenum billet weighing 1500 lb. Its operating principle makes it possible to produce unusual shapes and sections with a minimum of additional equipment. Another plus: Compaction is more uniform than it is with conventional presses.

• The liquid system is isostatic, meaning that the pressure is uniform from all directions. Result: Excellent compacting of the powder.

For those accustomed to thinking of hydraulic presses as large units containing a ram actuated by hydraulic fluids, the new press will show surprising differences. It consists essentially of a closed steel cylinder filled with water treated with rust inhibitors. The vertical cylinder is about 7 ft high and has a screw-type closure at the upper end. Since the weight of the closing head made seizure of the thread a problem, it is separately supported and mechanically lowered as the press is closed.

Hollow tubes can be made by using a hollow mold, and the production of flat pieces or parts of varying sections presents no major problems. With a proper mixture of metal particles, shrinkage is quite predictable, so that an allow-

ance can be made when planning the original form.

New applications are being developed as experience is gained with the equipment. One now being explored: Forming flat billets for rolling sheets. It will also be possible to process several parts simultaneously, even though they have different shapes. Green compacts are machinable where intricate forms are required. The new equipment, Mr. Felten says, will remove many limitations in the manufacture of refractory metals by the powder metallurgy route.

The requirements of high temperature technology for forms of tungsten and molybdenum other than wire have resulted in many studies of forming.

How Sylvania Tames Refractory Metals

THE HIGH melting points of tungsten, molybdenum, and their alloys impose severe limitations on pyrometallurgical processes in the forming and refining of the metals. Sylvania, one of the major producers, has concentrated its efforts on powder metallurgy methods.

Since further purification of the metal powder after forming is difficult, a high purity powder is required. The company also found that particle size distribution must be controlled so that the pressed powder is as dense as possible before sintering.

Starting material is wolframite ore, which is digested in a caustic solution and filtered as the first stage of purification. Subsequent chemical procedures insure a high purity oxide of controlled particle size. The oxide is fed into a tube type furnace in boats or trays and reduced to a metallic powder by hydrogen gas. Initial particle size, flow rate through the furnace, and temperature cycles govern final particle size. Sizes vary with the application.

When tungsten wire is produced by conventional methods, the powder is placed in a die and formed into a square bar about 6/10 in. on a side and 2 ft long. (Its cross section is limited by a problem called bridging.) The green compact must be handled with extreme care. Placed on special supports, it is heated in an atmosphere of hydrogen at 2200° F to give it enough mechanical strength for further handling.

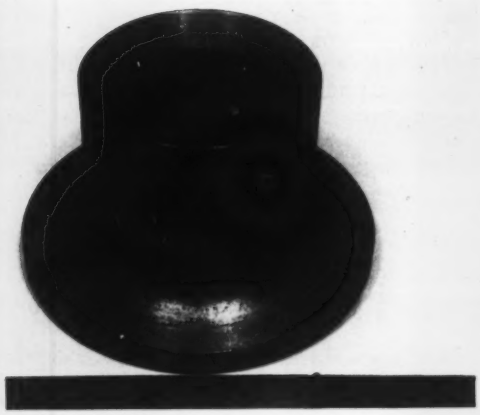
Next, the bar serves as the resistor in another furnace where it is heated to 5400° F. Density reaches 92 per cent of theoretical in the sintering process.

After sintering, the bar is heated and swaged in several successive

Molybdenum rolling slabs, as pressed. Liner has not been removed from one

This tantalum shape, pressed from powder, will be machined for a rocket motor part. Weighing 70 lb, it is valued at $4300

Tungsten blank for extrusion is formed as a hollow cylinder to reduce machining



Made from powder metal, this throat insert for a rocket motor has been machined

steps. The cycle includes intermediate anneals. The rod formed is ultimately drawn into wire. Rolling of the bar is not practical; the compacting of the swaging operation is required. Tungsten must be preheated to 2700° F for deformation, although metallurgically it is still being "cold worked."

• Bridging is a special problem that becomes more serious as the cross section increases. Tungsten and molybdenum are particularly recalcitrant offenders.

The powder may not flow well under pressure, and the particles form an arch or bridge which prevents the powder in the middle of the die being compacted.

Lubricants reduce bridging, but they are usually organic in nature and result in the formation of carbon during sintering. Tungsten can absorb the carbon, which would be harmful—so lubricants are avoided.

• The new press produces uniform pressures from all directions, reducing bridging problems.

In making a round billet, the first step is the preparation of a perforated metal cylinder, about a third larger in internal dimensions than the finished shape. A compressible liner is placed in the cylinder. After the unit is filled with powder, the liner is sealed, and the entire assembly is lowered in the press chamber by a hoist. The press closure is driven home; any air present is expelled by adding water, and the unit is connected to a hydraulic pump which raises the internal pressure to about 30,000 psi. The pressure is released, the head removed, and the green compact is taken out.

The large billets are less fragile than Sylvania's mechanical press compacts; a strong hammer blow is necessary to damage the green compact. But special handling equipment and procedures are required.

The compact is placed on a molybdenum plate charged into a special sintering furnace which Sylvania believes to be the largest of its kind. A hydrogen atmosphere is used. Structural problems in the furnace are severe because of the high temperature (around 3200° F) required for sintering. A walking beam mechanism is used to provide gentle movement through the furnace; the support members which reach into the heated zone are also made of molybdenum. Proper cycles, as well as temperatures, are important.

The billet is cooled in the hydrogen atmosphere. Little cleaning is required, but the billet is generally sandblasted to remove any loose material before further processing.

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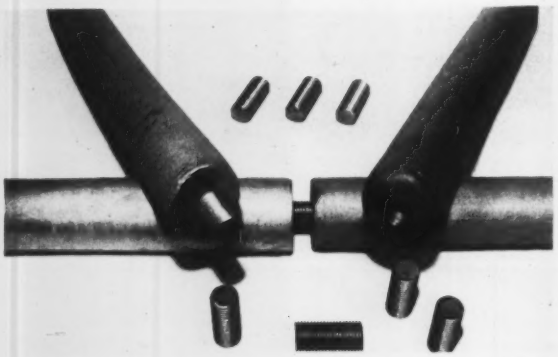
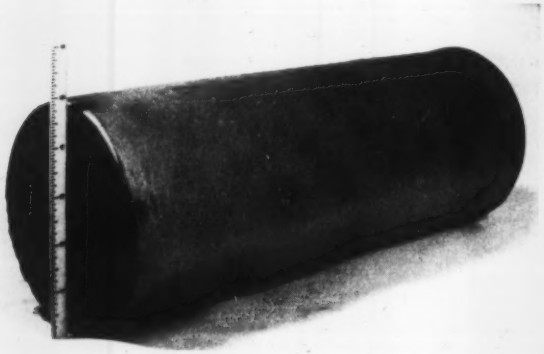
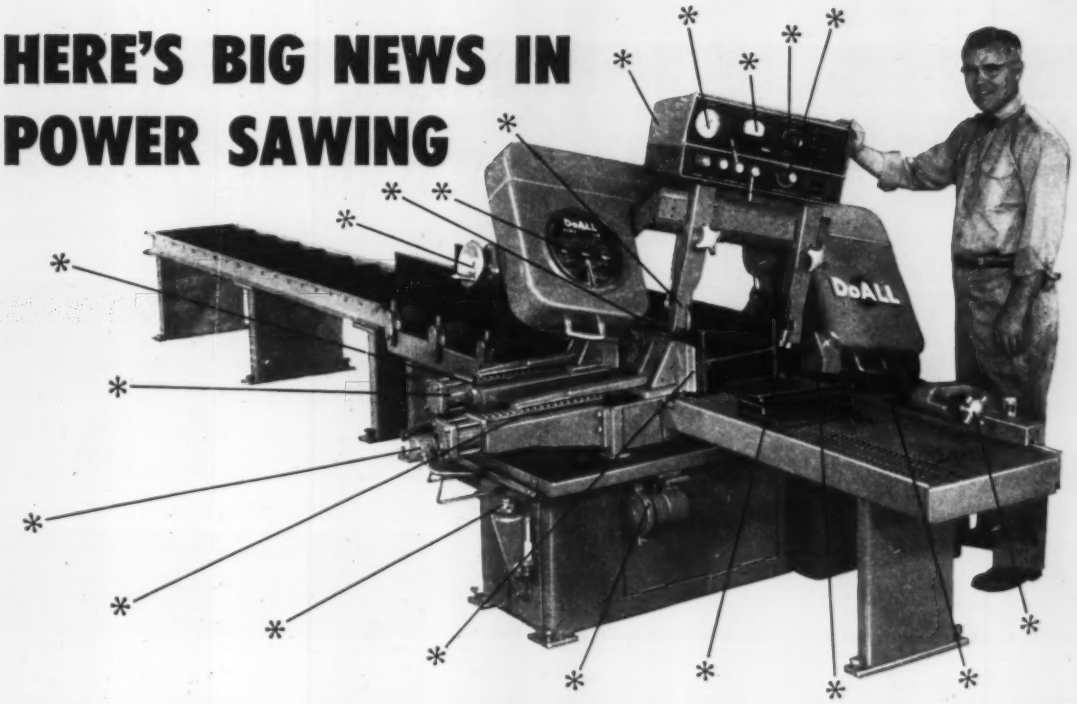


Molybdenum electrodes for vacuum melting weigh 70 lb each, are joined with molybdenum screw connectors



Tungsten forging billet, 5 in. in diameter and 12 in. long, is valued at $1000

HERE'S BIG NEWS IN POWER SAWING



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NEW JOB SELECTOR—a famous DoALL feature, now adapted for cut-off work. Guesswork eliminated for over 200 frequently used materials. Indicates correct speed, band type, coolant and anticipated sawing rate.

NEW SPEED INDICATOR—electronic tachometer permits more accurate setting and continuous monitoring of blade speed.

NEW FEED INDICATOR—suppressed type gage amplifies needle swing within sawing range for easier feed control and accurate repeat settings.

NEW WORK HEIGHT SELECTOR—(optional) eliminates wasted cutting head over-travel. Simply set control to size and head automatically rises just enough to clear workpiece. Dial control eliminates operator adjustments.

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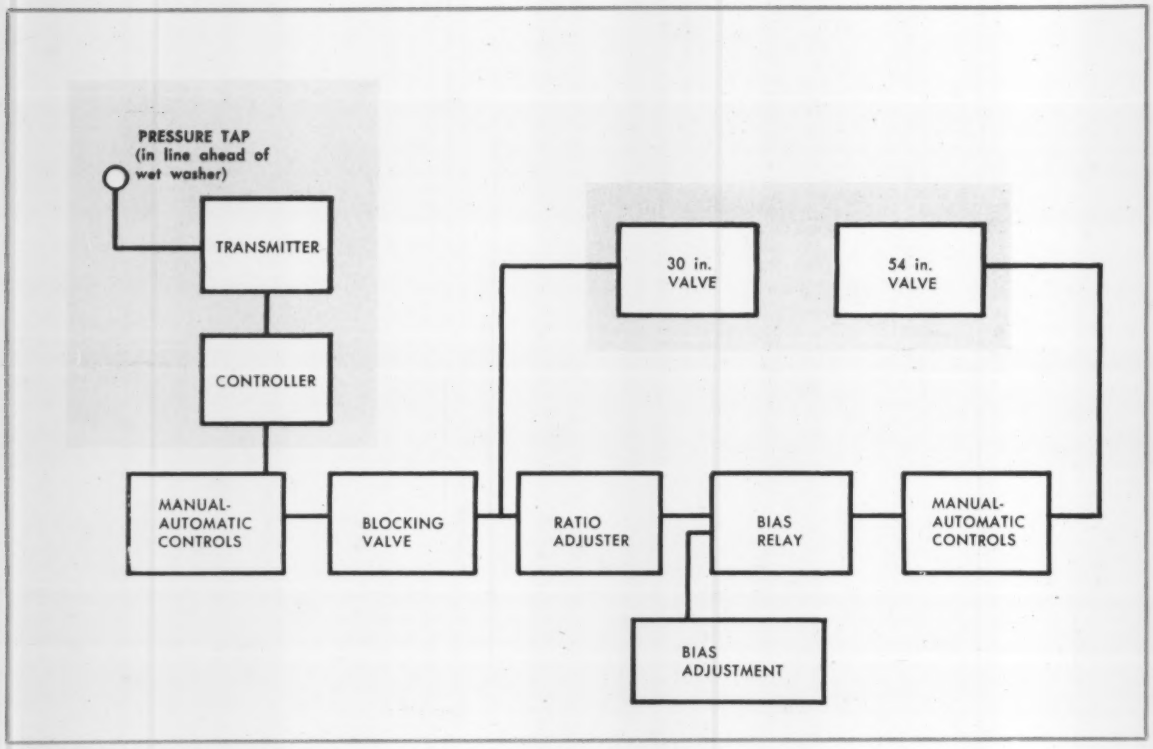
How to Boost Blast Furnace Efficiency



High top pressure, controlled automatically, is getting the nod over increased blast air velocity; it improves iron output without adding to flue dust losses

AUTOMATIC controls are helping many steelmakers boost blast furnace iron output with higher top pressures. Boosting pressure increases the weight of gas per cubic foot in the furnace, bringing more oxygen into contact with the burden. That's prefered over high blast air velocities, which increase

A pressure control system at Alan Wood Steel Co., Conshohocken, Pa is typical of several installed by Hagan Chemicals & Controls Inc., Pittsburgh.

• Controls actuate butterfly valves. Powerful operators insure rapid valve action.

Most top pressure control systems operate butterfly valves already on the furnace. Usually, valves are full line size, with poor regulating characteristics. Positioners on the stack at Alan Wood Steel show a high ratio of power available to power required. That makes for fast valve action and accurate positioning.

Two butterfly valves, on parallel lines, are operated by the system. A 30 in. valve is easily regulated but can't handle all system gas. The 54 in. valve boosts header capacity and provides system bias, or "dump."

Movement of the two valves is coordinated by a ratio adjuster in the system.

• Surges in the gas header system are minimized by a blocking valve.

A top pressure transmitter, in the line ahead of the wet washer, supplies signals to the pressure controller which, in turn, actuates valve operators.

Recordings indicate the effect of charging bell movement on the furnace gas header system. Volume change as bells are moved creates surges. Regulating valves are driven toward closed position, to maintain set pressure; surges occur as bells reseat. Furnace burden tightens, and iron output is decreased.

The effect is less noticeable when gas line volume is large in proportion to volume changes caused by bell movement. But elimination of surges is said to insure more efficient blast furnace operation.

In the Hagan system, a solenoid blocking valve co-ordinates valve and bell action; valve position is maintained until bells are reseated.

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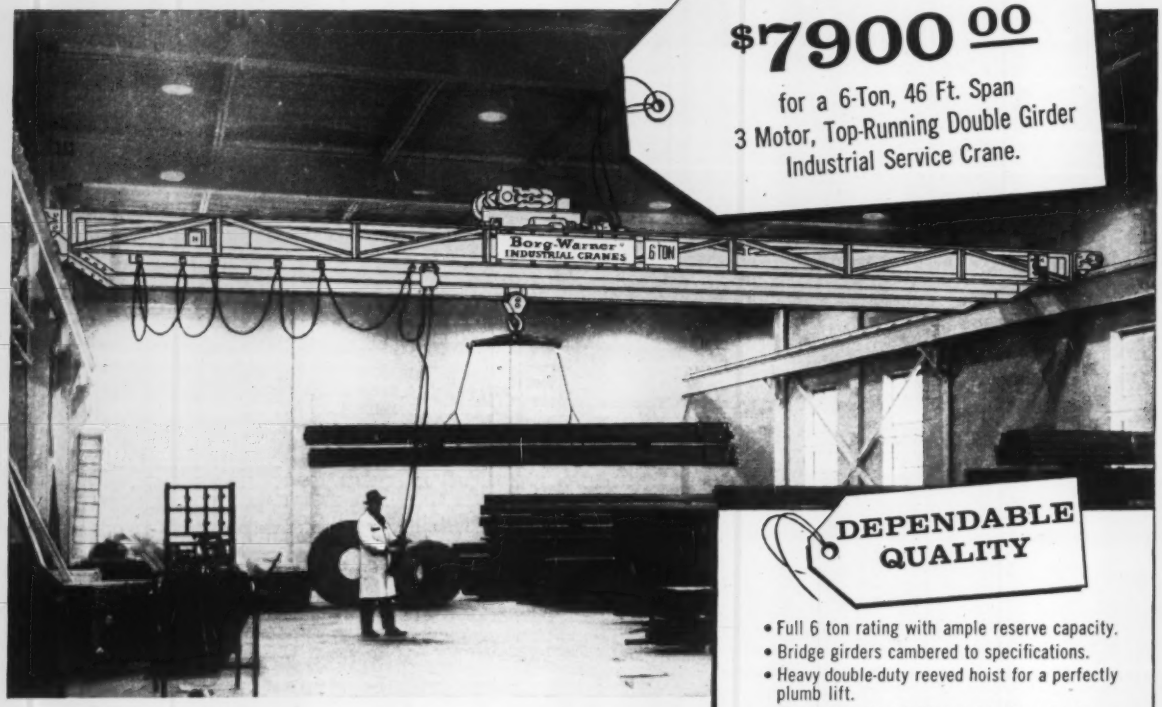

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- Heavy duty steel bridge and trolley wheels.
- All welded jig bored, jig assembled end trucks.
- Long life precision ball and roller bearings throughout.
- Precision assembly of girders and end trucks with fitted bolts in reamed holes.
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- Heavy duty gear reduction bridge drive.
- Fluid coupled bridge and trolley drives.
- Full magnetic push-button floor control.

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The crane illustrated is a typical double girder installation. Span may be shorter or longer with greater or smaller capacity and for lighter or heavier duty, intermittent or continuous. Whatever your overhead handling requirements Borg-Warner Industrial Cranes can supply your needs with quality equipment at a price you can afford!

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Efficient overhead materials handling pays off. You get more overhead storage space than fork truck handling provides. You benefit from aisles and work areas uncluttered by floor-type handling equipment. You can reach all areas under the crane, the full length of the runway.

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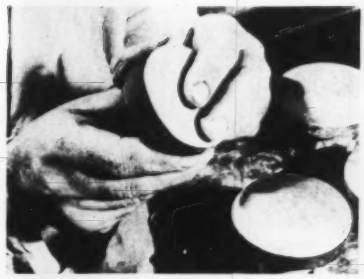
Throwaway Polishing Disc Eliminates Tool Wear



After stripping protective sheet of paper from the adhesive wire cloth, disc is pressed onto the tool

TROUBLED by tool wear in polishing operations? Perhaps a development at American Optical Co. can help you.

The company has eliminated tool wear by applying a throwaway wire cloth disc to the tool it uses in fining. (The operation immediately precedes final lens polishing.)

• **What It Is**—The 0.007 in., electrogalvanized, steel wire cloth is woven to 30 x 30 mesh by Reynolds Wire Div., National-Standard Co. The disc is cut to tool size (2⅝ in. in diameter) and held to the tool surface with pressure-sensitive adhesive.

The wire cloth holds the emulsified emery suspension used in fining. All abrasive action takes place at the interface of wire cloth and glass lens—there's no wearing action on the tool.

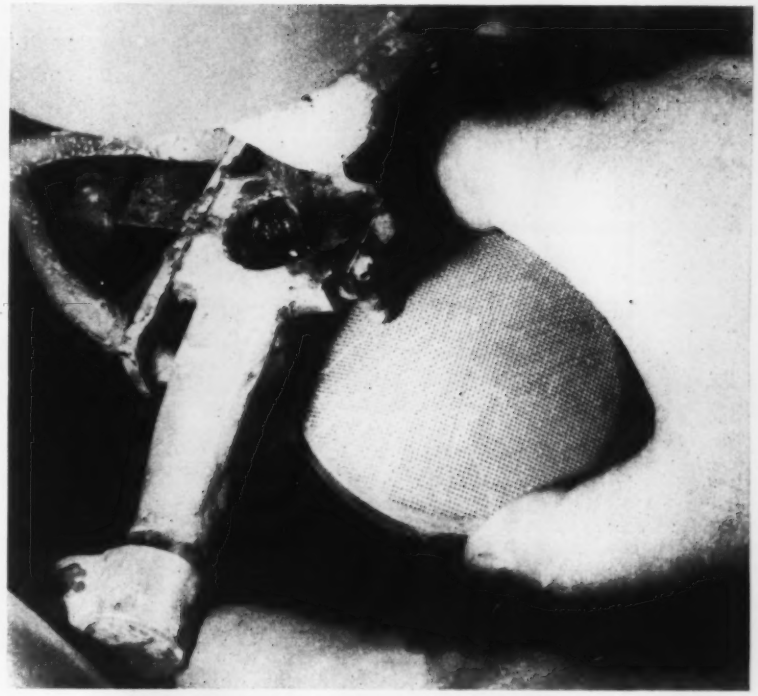
• **Benefits** — Advantages over the former method are fourfold:

• Because all the wear is taken up by the wire cloth, retruing of the tool is eliminated. Retruing was required after three or four finings and took about 15 manminutes.

• The cost of replacing worn-out tools has been eliminated.

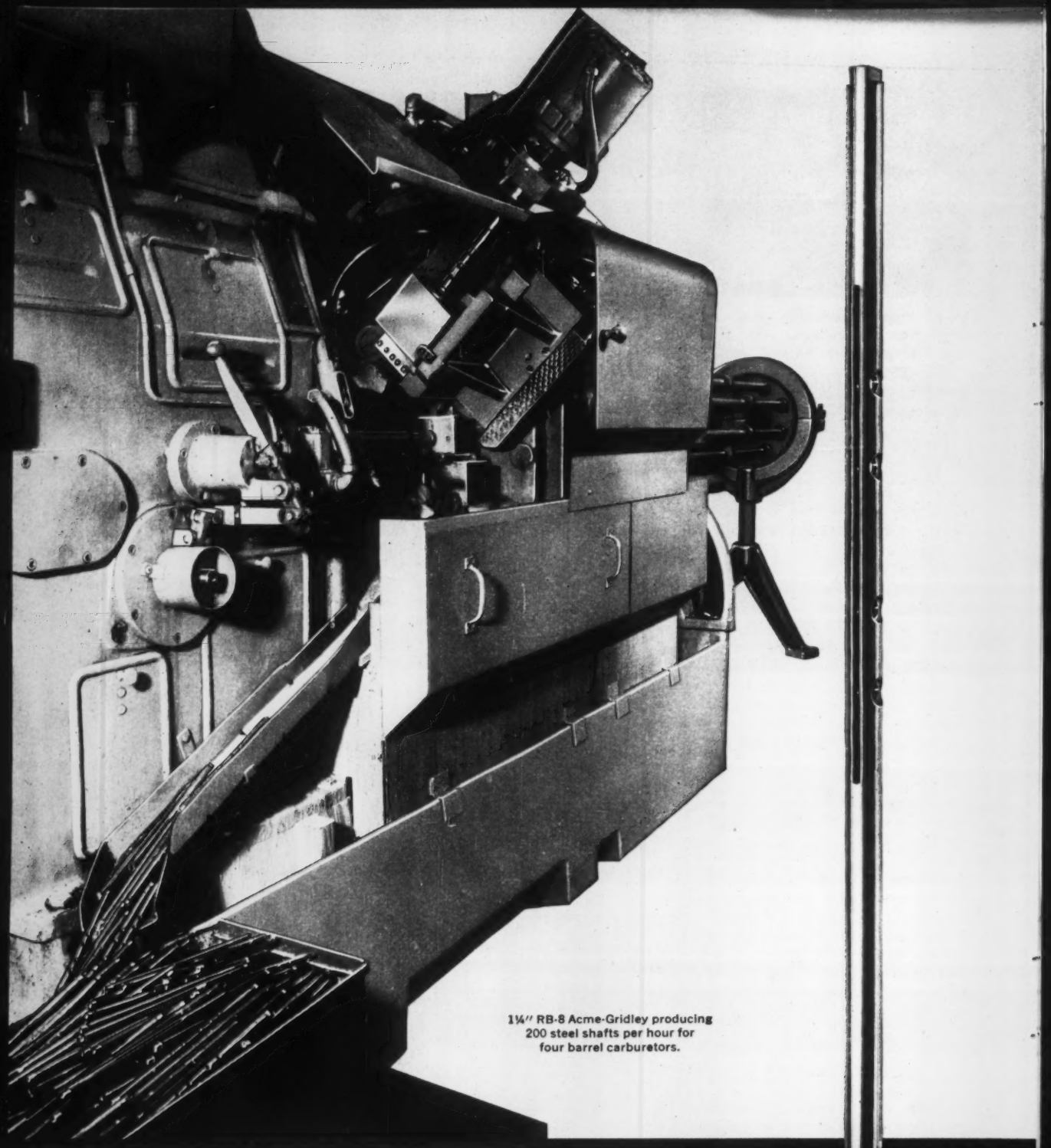
• Since the uniform, predictable thickness of the wire cloth replaces random wear of the tool, automatic operation is possible. The abrasive is held in uniform, intimate contact between the tool and lens and eliminates thinning of the abrasive solution due to centrifugal force.

• Time for the fining-polishing operation was substantially reduced by the uniform, automatic process. Human error was eliminated.



Tool is inserted in bottom chuck of fining machine. Overhead chuck carries the lens

Each lens goes through fining on one of four machines in foreground. Final polishing is done in one of eight machines toward rear



1¼" RB-8 Acme-Gridley producing 200 steel shafts per hour for four barrel carburetors.

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Direct Costs: these include direct dollar savings as realized by Carter Carburetor . . . an "every day" job for Acme-Gridleys.

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Direct Material Costs: our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems.

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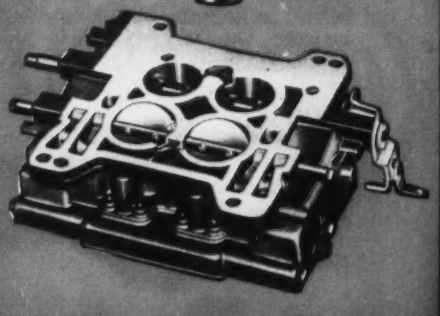
Spot Modernization: pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.



Versatile Acme-Gridley produces

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With Only Minor Changes in Tooling Setup

For Carter Carburetor *division of ACF Industries, Inc.*

Here's machine tool versatility at its best . . . versatility that provides documented cost savings for Carter Carburetor year in and year out. Machine investment and cost-per-piece are greatly reduced. Illustrated is but one example.

The spindles of a standard 1¼" RB-8 spindle Acme-Gridley bar automatic were locked against rotation with a simple spindle locking device. Each spindle functioned as a work holder when the machine indexed from position to position. The inherent accuracy of Acme-Gridleys assured precise alignment of the work with the standard and special attachments . . . whether it's the first or last piece in the run. When spindle rotation is desired, the locking device is simply removed and replaced by the spindle drive gear.

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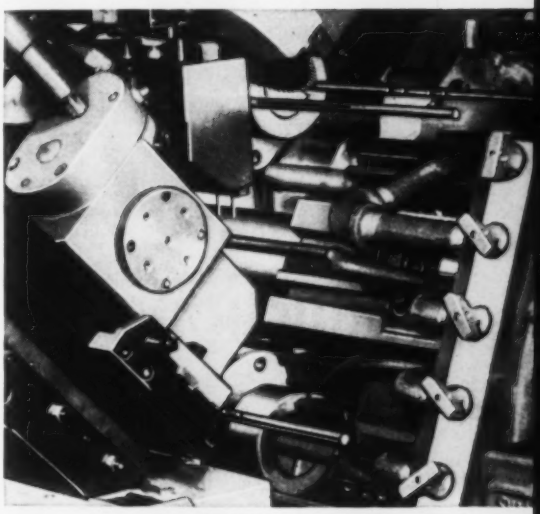
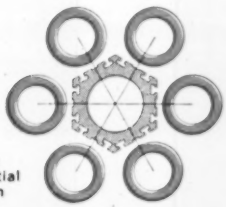


Close-up of tooling zone showing milling of slot in 4th position.



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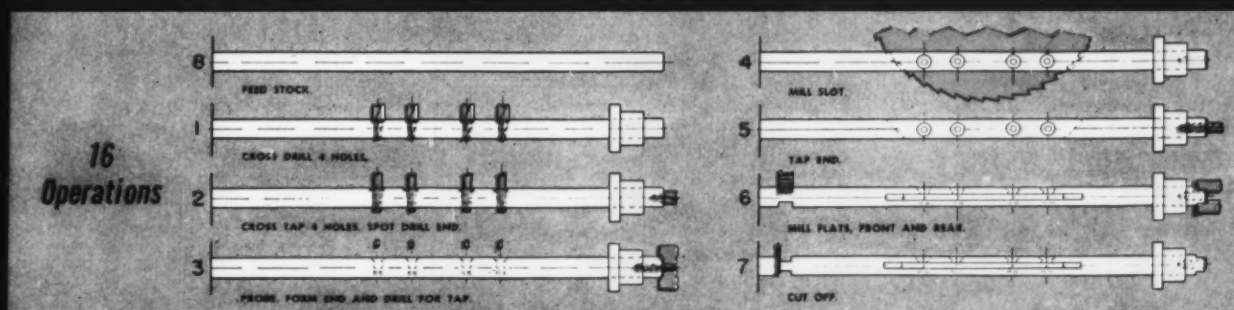
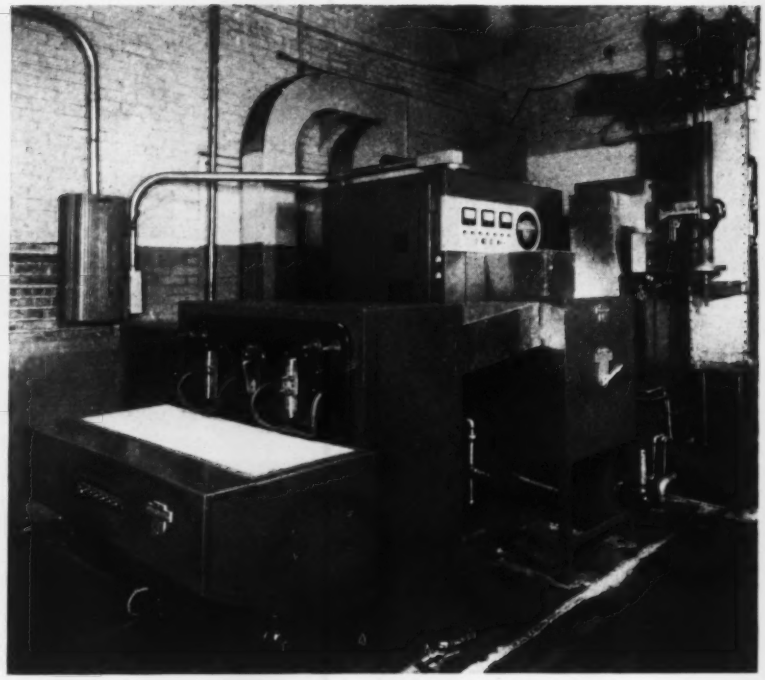


Single power source handles two work stations. The arrangement makes it possible to set up a job at one station while the other is in operation. Radio frequency switching is used



Multistation unit serves many purposes, takes little space

Induction Heating Unit Is Flexible

AN induction heating unit with a single power source that serves two work stations has been installed in a printing machinery plant by Induction Heating Corp., Brooklyn, N. Y.

A job can be set up at one station while the other one is in operation. The unit, which handles a wide variety of parts, occupies an area that's only 10 by 20 ft.

• Power source for the work stations is a single electronic generator with an output of 50 kw and a frequency of 250 kilocycles per second.

The high frequency power is directed to either of two work stations. A special radio frequency switch accomplishes the changeover, transferring power and the operating controls to the appropriate station, locking out the other one at the same time.

A general purpose heating station is on one side of the generator. It has two work positions, with a manually operated transfer switch to control the application of power. (The power is supplied through a variable ratio, radio frequency, iron core output transformer.)

Each work position has a timer to control heating, quenching, and fixture cycles; solenoid valves control the quench timing, and regulators permit adjustment of flow velocity. Either oil or water can be used for quenching. For brazing, soldering, annealing, or other operations not requiring quenching, a heat resistant cover, which serves as a work surface, is placed over the sink area.

• A vertical unit processes long shafts or bars on a progressive heating principle.

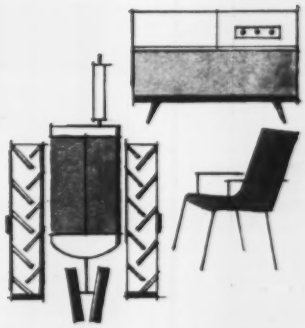
A motor driven carriage designed to handle steel shafts 4 in. to 6 ft long and up to 10 in. in diameter is used to move the bars through the heating coil. A Thymotrol system provides variable speed control of the carriage travel; cam operated switches determine top and bottom limits, reverse motion, fast, medium or slow traverse, and heat application times.

A variable speed upper spindle is provided to rotate the work during the heating and quenching cycles. A radio frequency transformer feeds the single turn low voltage work coil. Load on the drive is lightened by counterbalancing the carriage, and a plastic housing prevents loss of quenching medium.

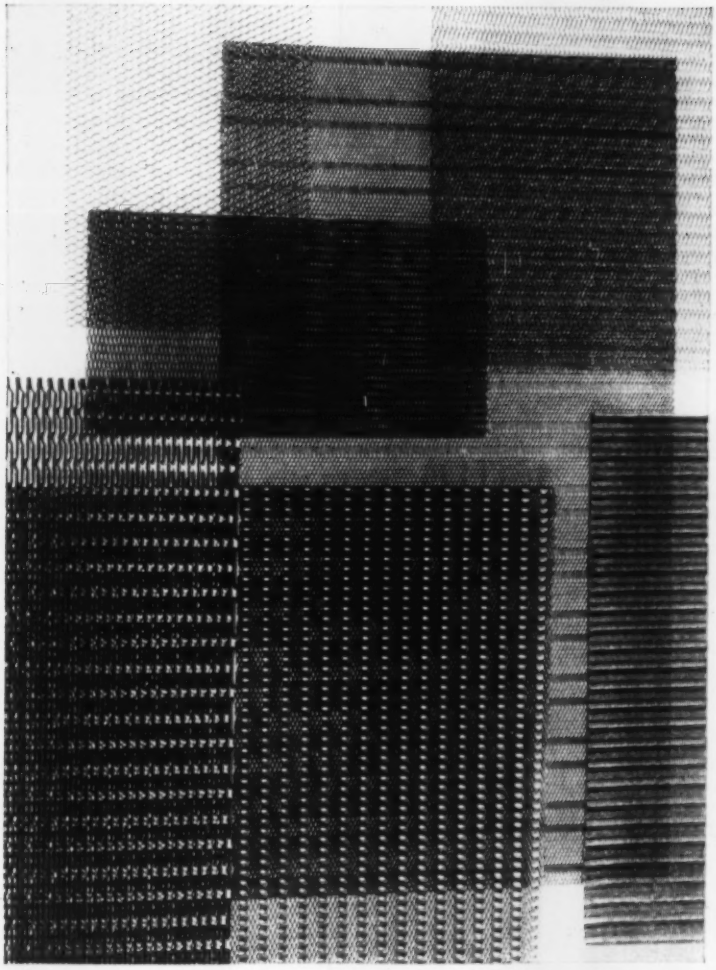
• Special features aid in trouble-shooting.

A series of eight lights indicates abnormal conditions, and internal switches automatically shut down the equipment if there is a coolant failure, preventing overheating. Gages indicate cooling water pressure and temperature, to provide a further check on proper operating conditions.

Inland "job-tailored"
Cold Rolled Sheets work better



product: EXPANDED METAL



problem:

the production of expanded metal panels for a wide variety of products ranging from automobiles to air conditioners, tractors to phonographs, stoves to patio furniture, television receivers and lawn mowers. These to be fabricated from decorator designs in an almost limitless range of complexity. Equipment, created specifically for the purpose, functions at highest efficiency and economy with coil steel which is cut and expanded. The often enormous stretch of quite narrow strands could cause breakage and rejection of the entire piece.

solution:

the problem presented was overcome by "job-tailored" Inland Drawing Quality Aluminum-Killed Steel. The steel not only took punishment of severe expansion and pattern formation, but provided an excellent surface for all subsequent finishing operations.

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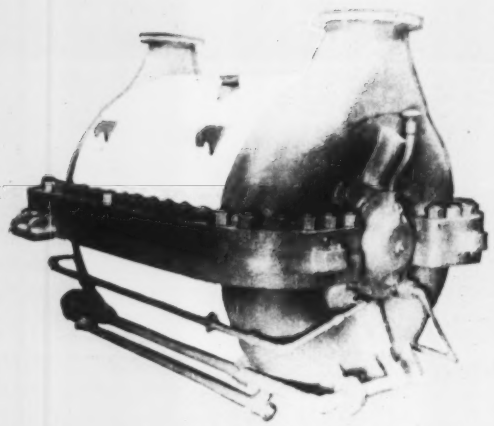
INLAND

Cold Rolled Sheets

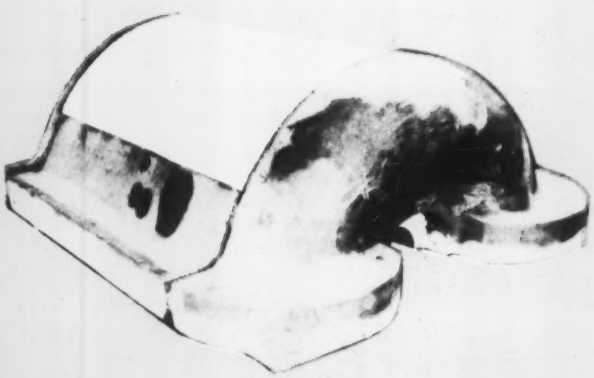
Welding Helps Casters Cut Costs, Improve Quality

Joining several little pieces to make one big one may be simpler, cheaper than one big casting, says author. He gives some rules to help you benefit from his experience

By JOHN MIKULAK
Asst. to the Vice President
Worthington Corp.
Harrison, N. J.



PIPELINE COMPRESSOR CASE incorporates formed plates (shown in white) welded to castings (in black)



STANDARD UPPER SHELL is fitted, ready for welding

CASTERS are finding it pays to take advantage of welding in designing and fabricating.

A good many firms (Worthington Corp. makes both weldments and castings) find welding a powerful aid in lowering foundry costs, improving quality, and getting improved product performance. By using welding in the right places, we are sometimes able to cut 40 per cent from the over-all cost of a solid cast steel assembly.

Here are some benefits which will help you evaluate the potential in combining welding and foundry techniques:

1. Welding cuts the cost of pilot castings, patterns and pattern modifications, molding, and machining of finished pieces.
2. Cast-weld design eliminates core prints and allows the use of thinner walls which cuts weight.
3. Welding permits inserts of special duty metals in critical areas.
4. Cast-weld design also provides more latitude in the original and revised designs.
5. Salvage by welding decreases scrap costs.

• To get the most out of welding in the foundry, we have found that many old ideas must be discarded and new ones introduced.

Any skepticism can be combated by demonstrating that most alloys can be welded if the proper techniques are used. Concentration on metallurgy often provides the needed answers.

When you design parts of large castings, a few basic rules will save much time and many headaches.

Each piece should be easy to trim for fitup—raw cast surfaces are generally unsuitable for joining. Weld deposits should be kept as small as possible, and each joint should be readily accessible.

Where possible, each component should have only one controlling surface and should end with a flange for easy fitting into an assembly. When increases in wall thickness are needed to strengthen large pieces, consider adding members fabricated from plates. It's an effective way to combat costs.

It may be necessary to put a little less emphasis on appearance when introducing noncast details, and you don't need ribs, flanges, and contour offsets used in one piece de-

signs to control hot tears (large pipe valves and fittings are examples). Many tapered sides can also be eliminated to modernize appearance and decrease weight and machining.

For maximum efficiency, avoid open corner welds to obtain a radius profile. Such joints are costly. Tee joints are good because you can use high energy rates of current to reduce distortion, residual stresses (with attendant cracking tendency), and cost.

• When making chemistry changes in a melt, consider weldability.

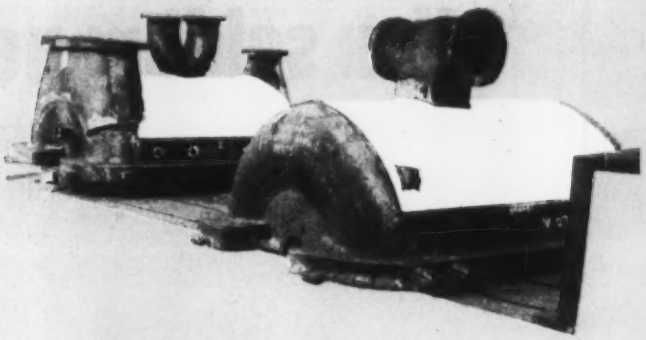
Residual chemistry must be carefully controlled too. Pouring a weldable grade of carbon steel immediately after a melt of 4 per cent chromium steel introduces a residual of 0.84 per cent chromium in the following heat—enough to require a complete change in welding procedure. Such deviations often require a special analysis and selection of a welding electrode to fit the chemistry—both take considerable time and expense.

• After combining castings with plates, heat treating practices must be altered. Worthington has found the 400 to 600° F range superior to higher values for preheating most carbon steel assemblies.

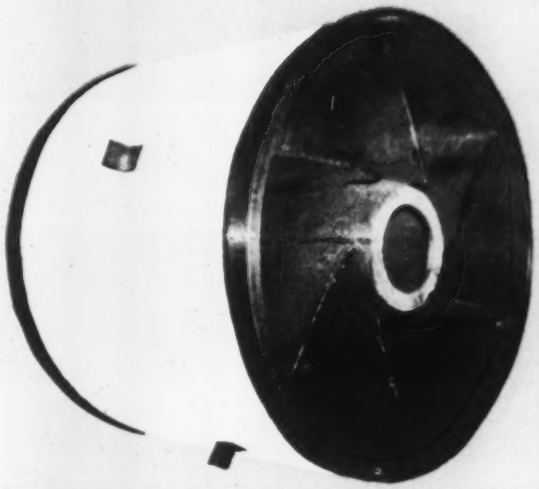
Casters must be aware that metallurgical problems in welding differ from those they usually encounter in an examination of regular equilibrium diagrams. Also, welding produces high cooling rates and peak residual stresses. Martensite is often the crystallization product, and preheating is needed to build a desirable structure.

Most foundrymen know that the heating rate of a regular casting is not as important as maximum temperature and cooling rate. But heating rate is vastly more important when heat treating weldments because the elastic limits of the weld, the parent metal, and the heat affected zone vary.

Other factors to consider: Hydrogen entrapment (baked out, low hydrogen electrodes usually eliminate the problem); choice of welding process (don't overlook the benefits of semiautomatics for continuous runs in one type of metal —they have high deposition rates); if you're still using the weight-piece or weight-pound pricing schedule, take another look—we found such practices penalize a small casting.



VARIETY on the same shell is provided by cast nozzles



PUMP DIFFUSER vanes and hub are castings. Wrapper is rolled from plate. If offers considerable savings over solid cast

• Salvage or repair is one of the most important functions of welding in a foundry.

We have found that most metals can be welded well enough to give adequate performance. That is particularly true when dealing with rough castings which are ideally suited to good welding procedures.

Cast iron welds quite well to several ferrous and nonferrous metals if nickel electrodes are employed.

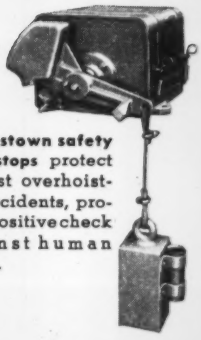
Most predominant errors: Improper cleaning and failure to strictly follow the recommended preheat, interpass temperatures, and weld bead sequence.

Electrodes ordinarily should be chosen to match the parent metal, particularly if castings are expected to operate above 400° F. Differences in coefficient of expansion can cause high stresses and cracking.

A final precaution: Remove and repair large defects a piece at a time, taking care not to weld the adjoining area where the defect hasn't been removed.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

You seldom need this sign



Youngstown safety limit stops protect against overhoisting accidents, provide positive check against human errors.

Write for Bulletins on any or all EC&M controls. They give complete descriptions of equipment and explain why EC&M control keeps cranes operating at top efficiency. Square D Company, EC&M Division, 4500 Lee Road, Cleveland 28, Ohio.

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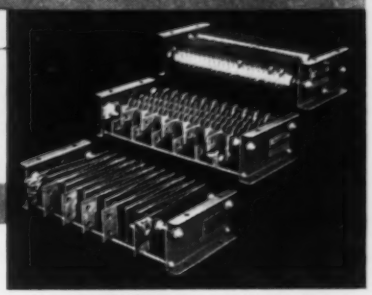
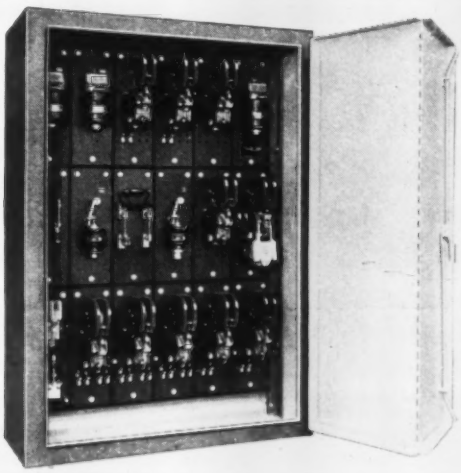
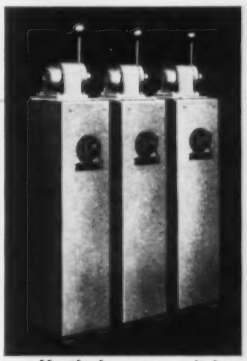
with EC&M CONTROL



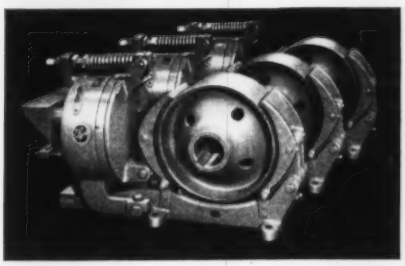
Tab-Weld resistors eliminate burning at the grid eyes or tap plates. Available in capacities from 13 to 500 amperes continuous.



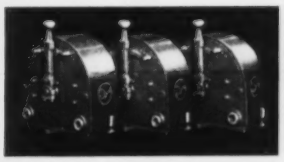
DC controllers are simple to maintain, provide pinpoint accuracy and safe operation.



Vertical master switches require little mounting space. Short throw reduces operator fatigue.

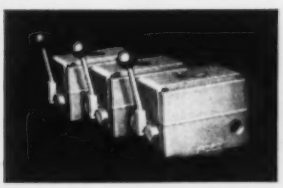


Long-life brakes give high-speed performance, have 100% lubrication so that dirt can be flushed out.



CM master switches have short throw of operating handle and narrow width for close grouping.

Manual-magnetic disconnect switches provide a convenient and quick means of "killing" the crane, including an emergency remote-controlled STOP button.



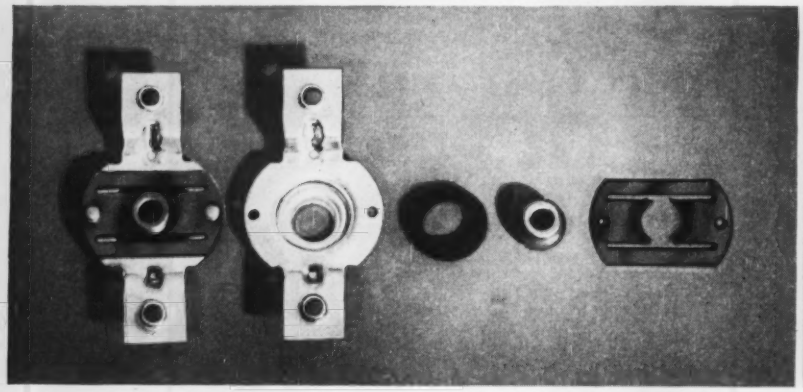
MA master switches provide a maximum of 3 speed points. Can be grouped with other masters or can be used on auxiliary drives.

WHEREVER ELECTRICITY IS DISTRIBUTED AND CONTROLLED . . . . .

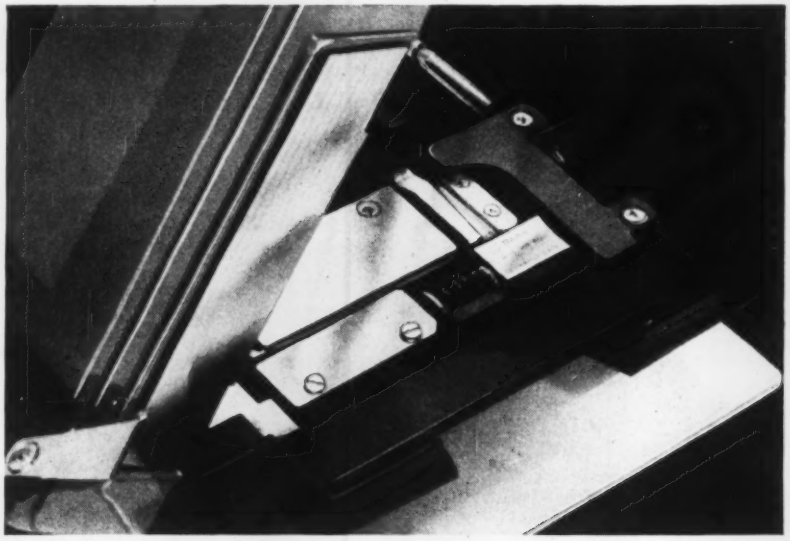
3880

NEW BRONZE
CAN CUT SPRING COSTS—

Superfine-grain phosphor bronze by Anaconda now handling many tough jobs, replacing costlier materials.



RETAINING CLIP for a bronze bearing in the Handy Hannah Hair Dryer was originally of spring steel. Rejections ran 20% in the stamping operation and another 20% at the assembly stage. The Handy Hannah Products Corp., Whitman, Mass., switched to Duraflex, Anaconda superfine-grain phosphor bronze, found it had not only the spring quality and fatigue resistance needed for the job—but also had superior formability which eliminated rejections.



SPRING CLIP takes a steady beating as it holds invoices in place in imprinting machines—used widely in handling charge accounts by retail stores and service stations. In the imprinter (right) made by the Farrington Mfg. Co., Needham Heights, Mass., this clip was originally of beryllium copper. Hearing about the superior fatigue life and endurance limit of Duraflex, Farrington consulted Anaconda technical specialists and decided to try it. Duraflex has been doing the job now for two years, stands up in service, saves $1.50 a pound in material cost.

TESTS by an independent laboratory show that design stresses for Duraflex wire and flat springs can be from 33% to 50% higher than for those made from regular phosphor bronze—yet Duraflex costs no more than regular phosphor bronze. Get the test reports and revaluate all your components requiring spring properties. For copies of these reports or technical help in selecting the right alloy and temper, see your Anaconda representative. Or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 5948

DURAFLEX®

SUPERFINE-GRAIN PHOSPHOR BRONZE

A PRODUCT OF

ANACONDA®

Made by The American Brass Company

Automatic Profiler Is Faster, More Accurate

COMPLEX, irregular two dimensional shapes can be reproduced with the aid of a Magnetrace automatic profiler. Speeds, feeds, and accuracy of precision, plain milling operations are claimed for the unit.

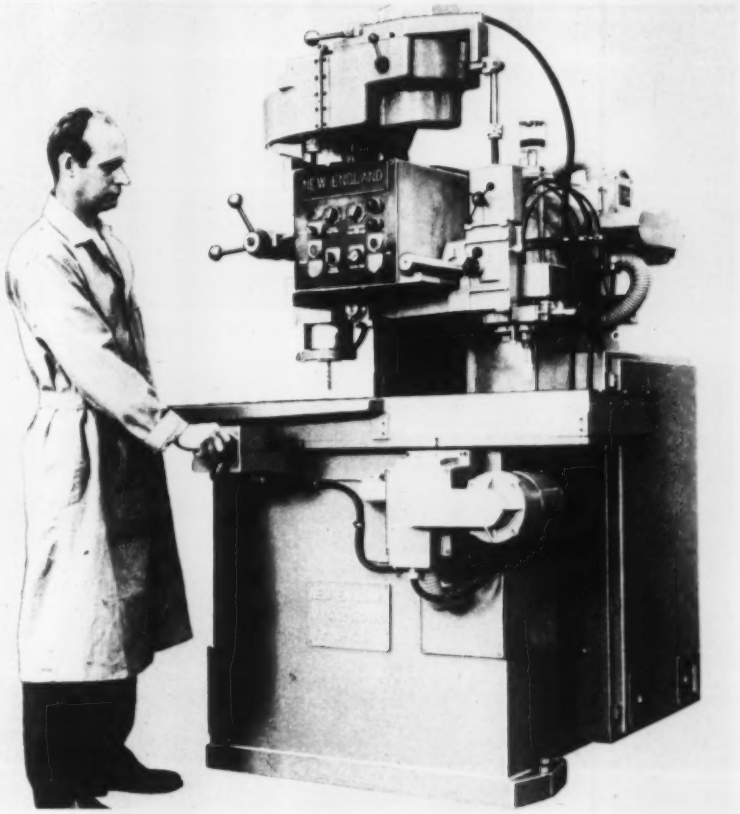
You get faster metal removal, finer finishes, and longer cutter life, says the company. Some jobs ordinarily requiring roughing and finishing cuts can be completed on the Magnetrace in a single pass.

Rigidity of the unit prevents backlash in slide motions. Tracer system sensitivity: A stylus deflection of only 0.0002 in. activates the table and cross head drives. The machine has a 5 hp spindle drive with seven speed changes. Total range is 375 to 5200 rpm.

Tooling requirements: A suitable workholding fixture, a mild steel template, and a tracer stylus the same diameter as the cutter.

The machine is designed to permit easy and economical tooling for operation under automatic cycle control where moderate to high production quantities are involved.

For further information, *write* Pratt & Whitney Co. Inc., Charter Oak Blvd., West Hartford 1, Conn.



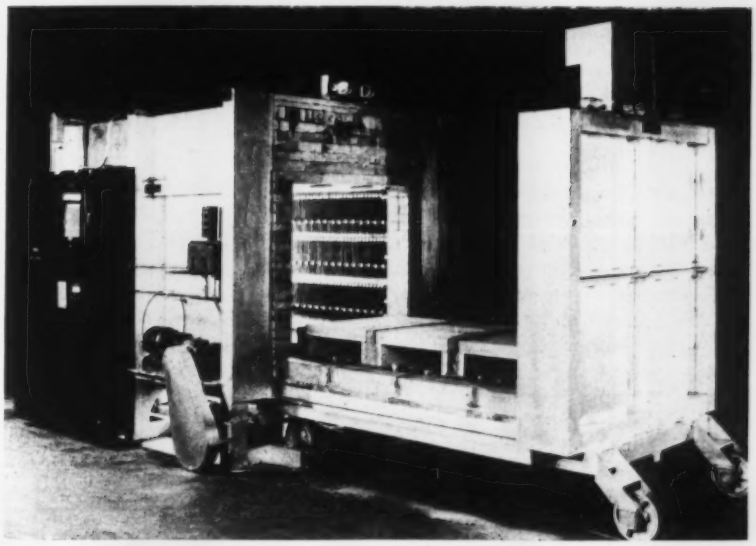
Car Bottom Furnace Self-Contained, Portable

SELF-CONTAINED, portable car bottom furnaces made by Waltz Furnace Co. are 6 ft long, 3 ft wide, and 3 ft high. Rails or pits below floor level are not required. They can be moved intact if necessary.

The car is motor driven by a rack and pinion gear. Additional wheels pick it up as it runs inside the furnace.

Heating elements are mounted on the inside walls, the door, and on the car. They're connected to a 440 volt, 3 phase, 60 cycle contactor and draw a 100 kw maximum. Power demand can be modified by a time switch that changes element connections.

A strip chart recording instrument (Leeds & Northrup Model "S") controls the furnace. A Wheelco instru-



ment shuts the furnace off automatically if it overshoots the set temperature. Circulation at low temperatures is provided by a motor driven fan in the roof.

For further information, *write* Dept. 9, Waltz Furnace Co., 1901 Symmes St., Cincinnati 6, Ohio.

Induction Heater Is High Frequency Type

THIS 10 kw output induction heating unit (Model LI-10C-1) operates at about 4 megacycles. Power input is 230/460 volts, 3 phase, 60 cycles. You can obtain other frequencies and voltages.

Power consumption is 20 kva maximum at a 90 per cent power factor. The Type 6420, water cooled, oscillator tube is powered from six industrial Type 575-A mercury vapor rectifier tubes used in a three phase, full wave, rectification system.

The unit is totally enclosed and has a gasketed door for dust and fume protection. Dimensions are 76 x 40 x 40 in. The metal frame and panel are constructed in a way that helps protect internal components and prevents excessive radiation. The unit is mounted on heavy channel iron skids and has overhead cross members for lifting. Net weight: 1950 lb.

For further information, *write* Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill.

Seamwelding Machine Joins Wide Range of Gages

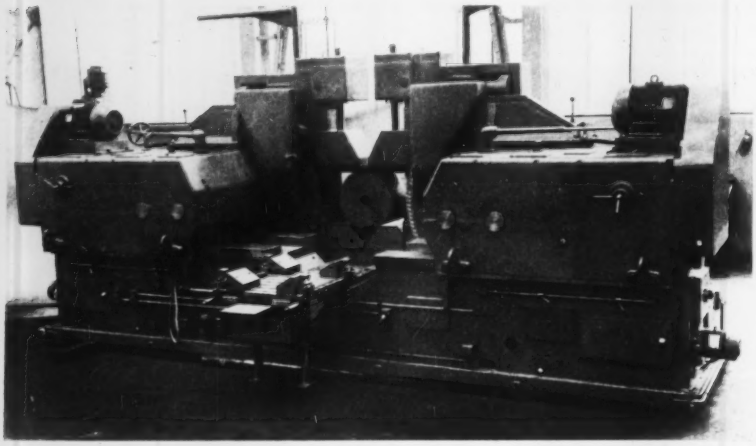
GAGES from 0.001 to 0.01 in. or more can be welded by the Hughes precision seamwelding machine.

Model VTW 500 can handle stainless steel, nickel alloys, Kovar, and other new alloys, says the maker. By throwing a switch, you can change from foils to materials ten times or more thicker. It's done by a phase shift heat control circuit that is adjustable to extremely low heat settings for delicate materials and can still operate with stability at full power output (2.8 kva) on a continuous duty cycle. Welding speed is also adjustable at 60 or 120 spots per second.

Model VTW 501 has a control that makes it suitable for spotwelds timed from 2 to 20 cycles. Thickness range is 0.0005 to 0.035 in.

Both welders have inputs of 220 or 440 volts, 300 watt power input-standby, and a power load of 30 amperes maximum at 240 volts.

For further information, *write* Vacuum Tube Products Div., Hughes Aircraft Co., International Airport Station, Los Angeles 45, Calif.



Saw Cuts Big Rounds, Squares, Slabs

LARGE rounds, squares, and slabs of alloy steels can be cut with the Duplex cold sawing machine (WKD1600). It has two saw carriages on a single rigid base.

The blades oppose each other (in the same plane) and cut simultaneously from both sides of the stock. At the center of the cut, one saw retracts in rapid reverse while the other completes the cut. An automatic shift prevents accidental contact of the two blades.

With the 63 in. diameter blade, you can cut rounds and squares up to 34 in. wide. The 71 in. blade can handle widths up to 37½ in. Slab capacity for both units is 20 x 42 in.

Both saw carriages and hydraulic vises are operated from a common control panel. The right side vise column is stationary. The left moves for different stock sizes. The powered lifting infeed roller has a 12½ ton capacity.

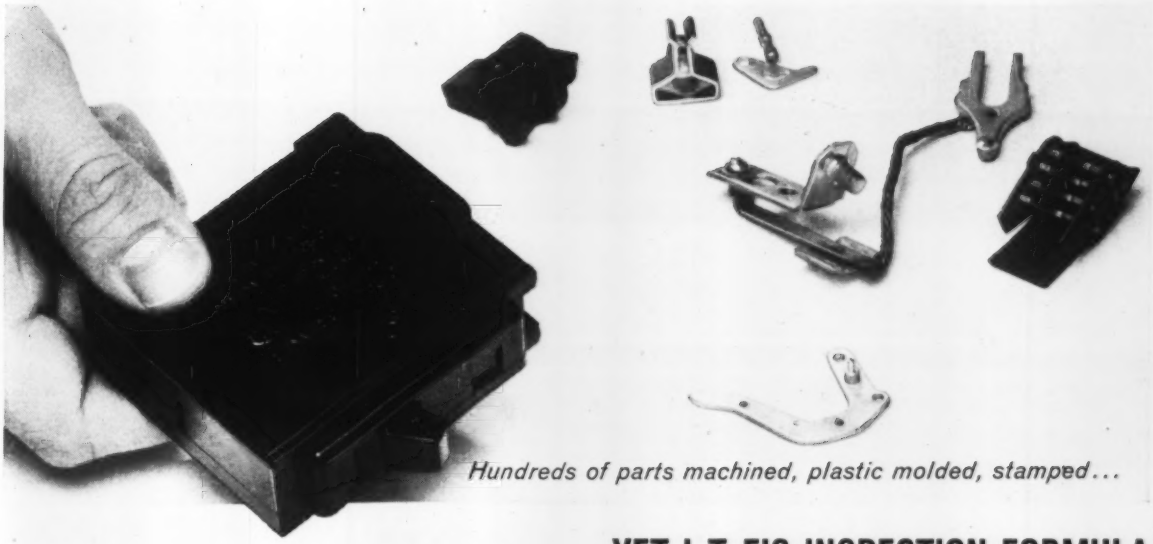
For further information, *write* Albert Klingelhofer Machine Tool Corp., Industrial Park, Kenilworth, N. J.

Press Has More Die Space, Three Shut Heights

AN 8 TON power punch press (Series 90 OBI) can do jobs requiring unusual vertical or horizontal die space. You can choose from three shut heights with a standard 1¼ in. stroke (stroke down). The measurements (7¾, 10¾, or 13¾ in.) are without bolster plates.

Other strokes of 1½, 2, 2½, and 3 in. can be supplied on order as well as strokes of 1 in. or less. Bed area is 11 x 8 in. with a 12 in.

(*Please turn to Page* 180)



Hundreds of parts machined, plastic molded, stamped...

YET I-T-E'S INSPECTION FORMULA GUARANTEES PRECISION AS PRODUCTION RATES MULTIPLY!

Optical gaging inspects these tiny circuit breaker parts, in some cases seven times faster than hand methods. Permits more thorough, often more accurate, inspection of linear dimensions, hole diameters and locations, radii, angles and contours.

"We've found a practical method to retain precise quality in the many small parts we make to go into our circuit breakers," says the Small Air Circuit Breaker Division of I-T-E, in Philadelphia.

"That method makes *full* use of optical gaging with our Kodak Contour Projectors. They're in constant use to improve our quality and avoid production headaches at the same time.

"Starting in *receiving*, all components from our suppliers are optically checked to save later production snags. Tool and die samples and experimental parts in the *tool room* are optically checked. And finally, we inspect parts right in the *production* line. This way, inspection bottlenecks just don't happen."

Here are just a few reasons why I-T-E and other firms find inspection with a Kodak Contour Projector fast and accurate:

Parts and fixtures are easy to set up, even large parts.

You have a constant 8" of working space regardless of magnification.

You can easily see and check what you're inspecting because there's brilliant, uniform illumination over the entire screen area, and the image is always erect and unreversed—at any magnification you select.

To learn more about these and other features of the Kodak Contour Projector and how they can ease your inspection problems, write for the booklet, "Kodak Contour Projectors."

Special Product Sales

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

the KODAK CONTOUR PROJECTOR

Kodak
TRADE MARK

MOVING huge tank with an American 300 Series Truck Crane.

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ON CRAWLERS—ON RUBBER—ON RAIL

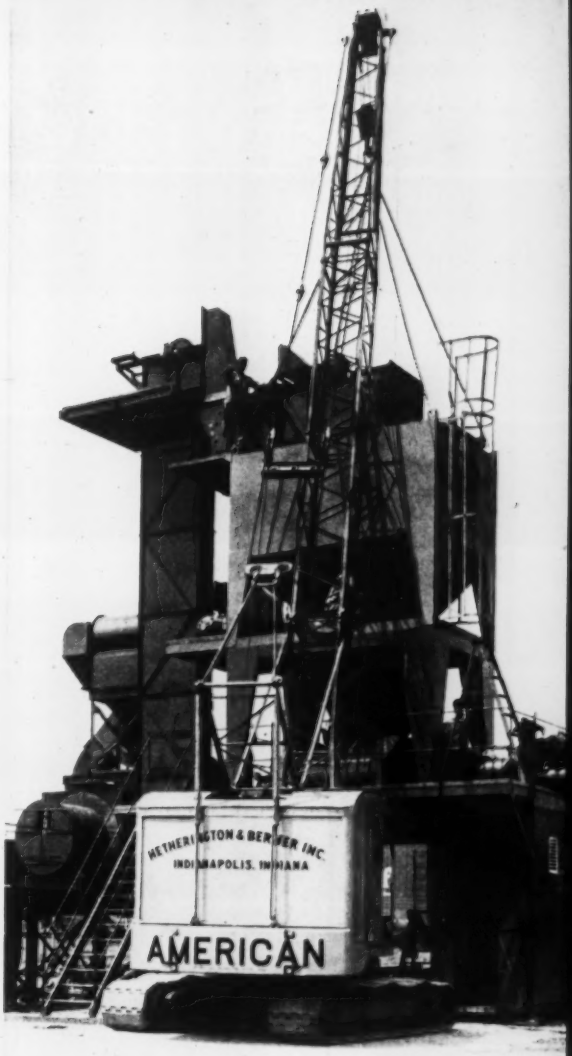
Whatever your demands, American Off-Track...On-Track Cranes assure you of top materials handling production

Here is American dependability at its best . . . boosting production on *any* materials handling job.

You can always count on the full line of American Crawlers, Truck and Self-propelled Cranes on the ground—Locomotive Cranes on Rail—to give you maximum effort in every type of work. Serving industry for over three-quarters of a century, American equipment is now better than ever . . . better than *any*. Write us for complete detailed and illustrated catalog information.

HANDLING long sections of pipe in the yard with an American 300 Series Truck Crane.

ASSEMBLY (right) of an asphalt mixing plant with a 300 Series American Crawler.



MANEUVERABILITY in crowded quarters (above) with an American Truck Crane.

HOOK WORK in the yard: American DiesELectric® Locomotive Crane.

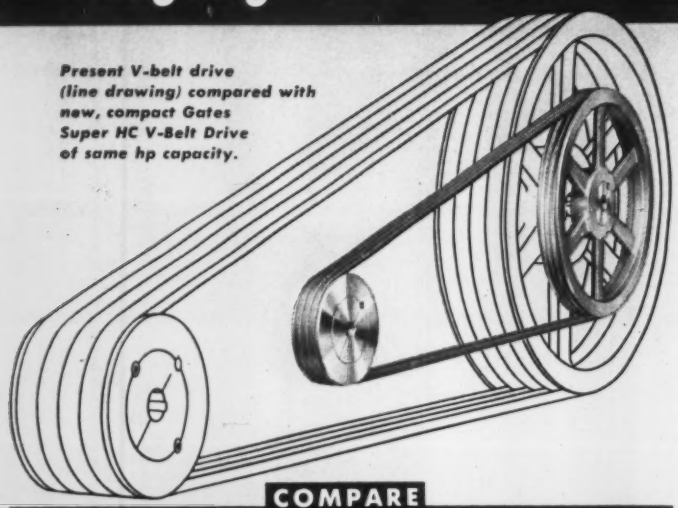
AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

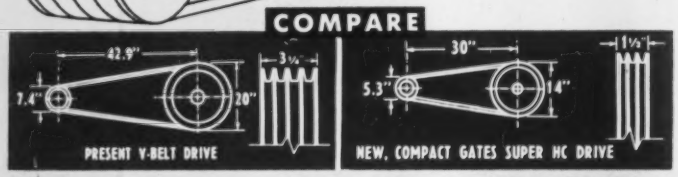
EXCAVATORS-CRANES to 2 yds.-60 tons
LOCOMOTIVE CRANES to 130 tons

DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

Designing NEW DRIVES?



Present V-belt drive (line drawing) compared with new, compact Gates Super HC V-Belt Drive of same hp capacity.



Save up to 20%

with new high capacity V-belt drive

When you change the whole drive — both V-belts and sheaves — remember: The cost of a Gates Super HC V-Belt Drive is as much as 20% less than the cost of present V-belt drives of the same horsepower capacity.

A development of Specialized Research in the world's largest V-belt laboratories at Gates, the new Super HC V-Belt makes possible the most compact, lightest-weight, lowest-cost multiple V-belt drive you can put on any machine!

Cuts drive space as much as 50%

With Gates new Super HC V-Belt, sheave diameters and widths can be reduced 30% to 50%, center distances 20% and more. Bearing load is lightened and total space occupied by the drive may be cut as much as 50%.

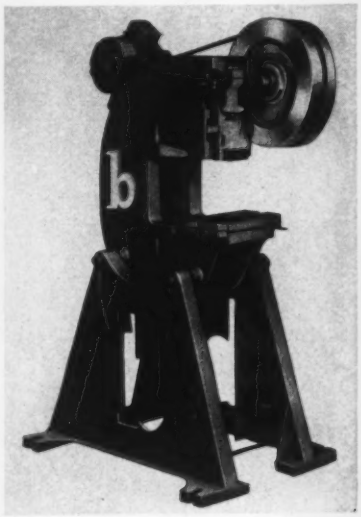
"The Modern Way to Design Multiple V-Belt Drives" is an informative handbook on the Super HC Drive, available from your nearby Gates Distributor listed in the Yellow Pages of your phone book.

The Gates Rubber Co., Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ont.
World's Largest Maker of V-Belts

TPA 439

Gates SUPER HC V-BELT Drives

NEW PRODUCTS and equipment



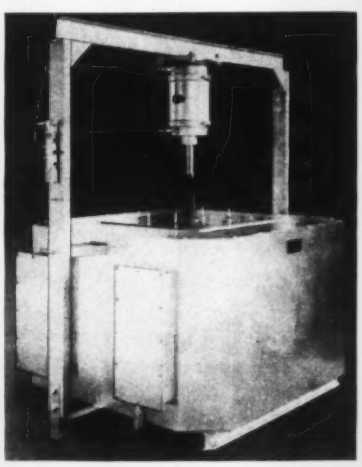
clearance between center of slide and frame. Direct belt drive and back geared models are available.

For more information, *write* Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif.

Hot Load Testing Furnace Does Pressure Sintering

PRESSURE sintering (up to 200 psi) at temperatures up to 2750° F can be done in the Pereny electric hot load testing furnace. Infinite pressure control is provided by a manual control lever. It operates a hydraulic cylinder and ram mounted on the pressure frame.

Power controls and your choice of temperature controls are mounted



on a separate control panel. Power controls consist of a voltage regulating transformer, fine to coarse deadfront switches (36 taps), input ammeter, and a magnetic contactor. Power requirements: 23 kw, 220 volts, 60 cycles, 3 phase. You can also get a 3 phase, 440 volt version.

For further information, *write* Pereny Equipment Co., Chambers and Pereco Streets, Columbus 12, Ohio.

Paint Resists Acids, Alkalies, Moisture

A CORROSION resistant paint called Parifco uses a chlorinated rubber base vehicle combined with alkyd type resins.

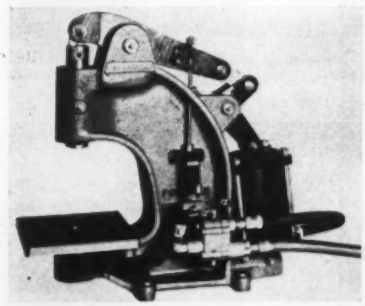
It's said to be highly resistant to moisture, constant humidity, salt spray, acids, and alkalies. It dries quickly.

For further information, *write* Industrial Finishes Co. Inc., 1119 Land Title Bldg., Broad and Chestnut Streets, Philadelphia 10, Pa.

Bench Press-Riveter Has More Power, Accuracy

GREATER working power with less shock and increased production accuracy are cited for Trio Machine's bench press-riveter (Model DJB). Capacity is 2 tons on 100 psi shop air.

The unit has a 15/16 in. stroke and a 4 in. throat. It operates at about 200 strokes per minute. It can easily be moved (it weighs only 58 lb) and requires only one hose for operation. A bed plate



Need REPLACEMENT V-BELTS?

Improved Gates Vulco Rope gives you 2 important advantages

1. 40% higher hp rating at no increase in price: This important cost-saving advance is the result of Specialized Research in the world's largest belt-testing laboratories at Gates. **As replacements on standard drives these V-belts with 40% more load-carrying ability give longer service life... reduce down-time, cut belt replacement costs.**

2. Concave Sides (U. S. Pat. 1813698): The sides of Gates Belts are concave (Fig. 1). When the belt is bent around the sheave, the concave sides fill out—become straight—for full, uniform contact with the sides of the sheave groove (Fig. 2). Uniform contact insures maximum pulling power...even distribution of wear...longer life.

Available in all sizes from your nearby Gates V-Belt Distributor listed in the Yellow Pages of your phone book.

When designing new drives
use Gates new Super HC V-Belts and Sheaves.
See opposite page.

The Gates Rubber Co., Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ont.

World's Largest Maker of V-Belts

Gates

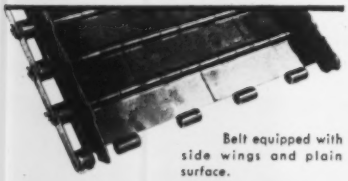
TPA 432

Gates Hi-Power VULCO ROPE V-Belts

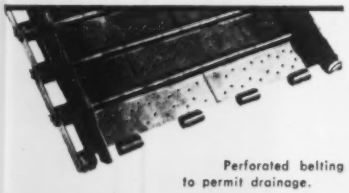
MAY-FRAN HINGED-STEEL CONVEYOR SYSTEM SOLVES ANOTHER PARTS AND SCRAP HANDLING PROBLEM

PHOTO: In this automotive plant, two May-Fran hinged-steel conveyors are utilized to speed production and clear scrap from the working area. Scrap is taken from under floor area and carried to chute where it crosses belt carrying semi-finished parts. Combination chute and storage unit discharges load only when tote box is in position.

8714-MF



Belt equipped with side wings and plain surface.



Perforated belting to permit drainage.

Cleated belting prevents fall-back.

Pre-engineered for maintenance-free operation, maximum economy and long service life, the May-Fran hinged-steel belting has been developed especially for handling all types of heavy and rough materials. This belting is available in any width or length to meet individual job requirements. CUSTOMIZED conveyors can be supplied from stocked component parts. Installations can be made below floor level, flush with floor or above floor level.

Write today for Catalog MF-100

MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Rd. • Cleveland 12, Ohio

NEW PRODUCTS and equipment

permits use of die shoes, bending forms, and other fabricating tools for operations such as punching, marking, trimming, straightening, swaging, broaching, and crimping. It can handle tubular steel rivets up to and including the ¼ in. size.

For further information, *write* Trio Machine & Mfg. Co., 35690 Vine St., Willoughby, Ohio.

Low Foaming Spray Cleans Metals, Inhibits Rust

WITH the Jet 108 spray cleaner, you can remove drawing compounds, oils, and greases, and inhibit rust. It can be used on ferrous and nonferrous materials (except aluminum). Working temperatures: 100 to 140° F.

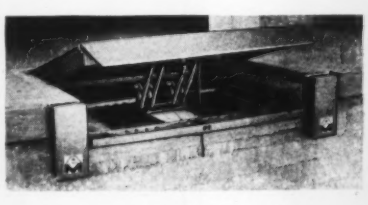
The penetrants, surfactants, and dispersing agents in Jet 108 give greater cleaning efficiency and longer use life, says the maker. The higher the concentration, the less it foams. Heavy dirt loads can be carried. The moist, granular alkali base product is nontoxic, dustless, and noncaking. You can use soak cleaners ahead of Jet 108 if you wish.

For further information, *write* Northwest Chemical Co., 9310 Roselawn, Detroit 4, Mich.

Free Floating Dock Board Speeds Loading, Unloading

YOU can increase truck loading and unloading speed with the aid of an Auto-Mechanical Dock Board. In operation, the free floating unit adjusts itself to the proper level so it will rest on the truck bed. It can support 20,000 lb in both working and cross traffic positions.

After loading, you only need to step on the dock board to return it to cross traffic position. If an



now . . . special performance VA steels melted under the highest vacuum obtainable in the industry today

(under .3 microns pressure)

The steels from our unique consumable electrode (CVM) vacuum melting furnace open a new phase in the aircraft, missile, steam turbine and other fields where utmost steel cleanliness and lengthened fatigue life are vital to higher performance. We will be happy to prove to you where these CVM Steels, and those produced by our Induction Vacuum Melting processes, can do far more for your needs than their difference in cost would indicate. Write for new brochure.

VA **Vanadium-Alloys Steel Company**

LATROBE, PENNSYLVANIA

DIVISIONS: Anchor Drawn Steel Co. • Colonial Steel Co. • Metal Forming Corporation • Pittsburgh Tool Steel Wire Co.

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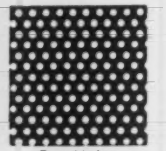
LET H&K PERFORATED MATERIALS

put personality into your products

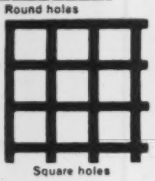


Round holes

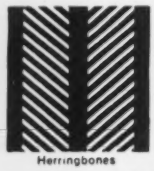
Whenever—wherever—your products require perforated materials, you will find the pattern and open area "just right" for that custom-look in the vast selection of H & K existing dies.

Modern facilities and H & K experienced craftsmanship, enable the perforating of practically all metals, wood, compositions and plastic. Perforated materials can be furnished in sheets, coils, rolls or plates. Fabricating services include shearing, rolling, welding and forming.

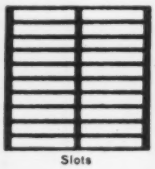
Illustrations shown in reduced size



Square holes



Herringbones



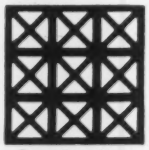
Slots

Oblong holes

Functional or Decorative Uses

H & K fills every need for perforated materials. Appropriate perforated metals can be ordered with color anodized, brushed and lacquered, painted, chrome plated, baked-on, or other special finishes.

Many patterns in steel sheets (industrial or decorative) are in stock at our warehouses. Send for H & K Stock List Brochure.



Decorative patterns

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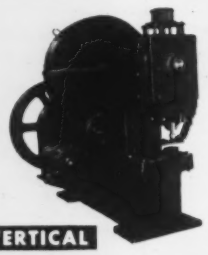
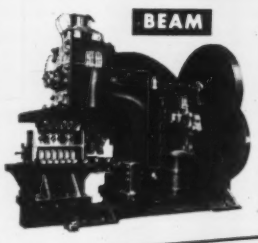


VERTICAL



BEAM

THOMAS has the punch you need

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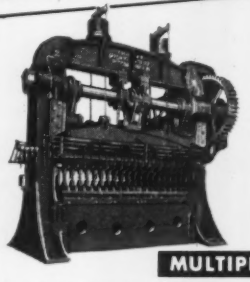

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A wide range of capacities for any punching need

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THOMAS MACHINE MANUFACTURING CO.

PITTSBURGH 23, PA.

NEW PRODUCTS and equipment

employee, fork truck, or overhead door is resting on the board, it will not rise when released.

Boards are self-contained and can be operated after clamping down. A 12 in. pit is required.

For further information, *write* Auto-Mechanical Dock Board Inc., 500 N. Standwood Rd., Columbus 9, Ohio.

Portable Sandblaster Small, Lightweight

THE Model B "Sandy Jet" is a lightweight, portable unit that is designed for blasting with all types of abrasives. It uses a pistol grip blast gun.

No special or separate work area is required. The abrasive can be easily contained in a small area with a cardboard box or cloth.

Three nozzle sizes are available. Included with the unit is an operator's hood, a face shield, and two extra nozzles.

For further information, *write* ALC Co., R. D. #5, Box 40, Medina, Ohio.

Hydraulic Feeds Speed Heavy Duty Drill Presses

THE Beckett-Harcum hydraulic drill press feeds are designed for older, large capacity units. They are self-contained.

Each unit is equipped with a heavy duty power transmission arm and control valves, a hydraulic tank,

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for the most exacting stainless application on the American automobile

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Spinning over the thousands of miles from assembly line to auto graveyard, wheel covers of Superior Stainless brightly prove their worth. Snow, mud, gravel, sand, road chemicals can't faze the stay-new look of stainless at this point of severest duty. In addition, precise care in manufacture of Superior Stainless assures the uniform, deep-drawing quality required in today's wheel cover designs. Whether your stainless requirements stress performance, appearance, or both in combination, *you'll do better with Superior*. Let us work with you!

Wheel covers illustrated manufactured by Lyon, Inc., Detroit, Michigan.

SUPERIOR STEEL DIVISION

OF

COPPERWELD STEEL COMPANY

CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

welded with M&T Murex electrodes

Guarding the nation's most treasured documents is a job entrusted to what is probably the world's safest safe. Nightly, or in emergencies, cases containing the Declaration of Independence, Constitution and Bill of Rights are automatically lowered into the safe which protects the documents behind mammoth self-locking doors. In its construction, the Mosler Safe Company depended on M&T Murex electrodes.

This is one of a whole host of vital jobs being done with Murex electrodes. Other examples: Behlen Frameless Metal Buildings, which have survived what is probably the world's toughest single test – a nuclear blast – rely heavily on welds with Murex electrodes in commercial, school and farm building construction. And for the world's best cars – those produced in the U.S. – more than one out of four is joined or unitized with reliable Murex welds.

So it goes. Where there is dependence on the integrity of welds, there is dependence on M&T Murex electrodes . . . and welding machines, too.

M&T offers one of the broadest lines of electrodes and wires for arc welding – over 1000 types and sizes; and a complete choice of welding machines. Ask the M&T man for details or recommendations. Or send for literature.

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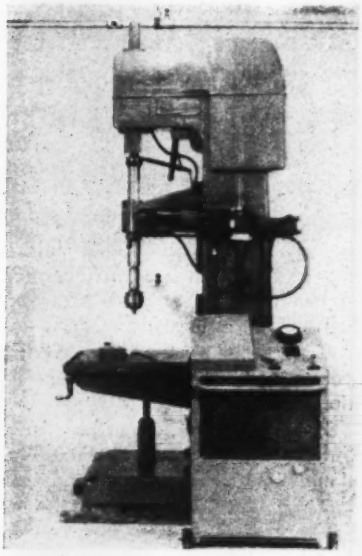
METAL & THERMIT CORPORATION, General Offices: Rahway, New Jersey



and a pump housed in a wheel mounted console. The hydraulic solenoid valve control system has a completely variable and quickly adjustable approach speed, slowdown for work entry, return speed, and working thrust.

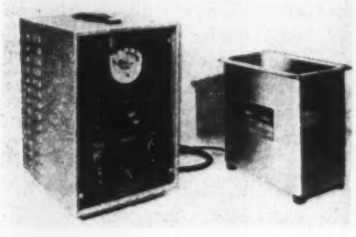
Precision limit switches and fast reaction valves (Hi-Cyclic) provide reliable depth control, says the company. Two sizes are available for adaptation to different machines and jobs.

For further information, *write* Beckett-Harcum Co. Inc., 985 W. Locust St., Wilmington, Ohio.

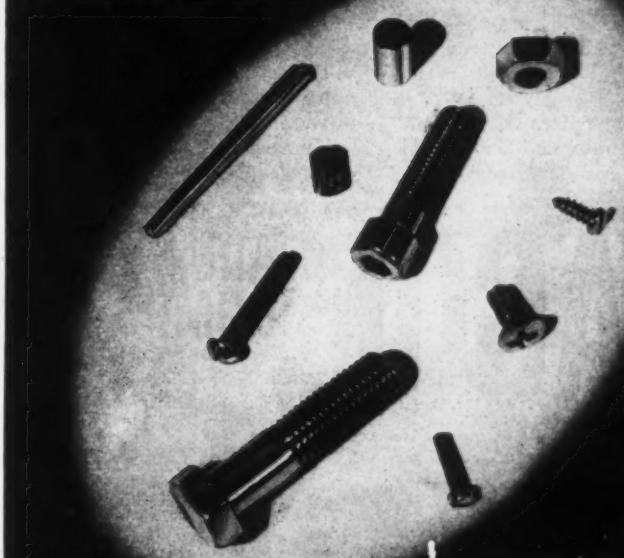
Ultrasonic Unit Does Small Part Cleaning

HERE is an ultrasonic cleaning unit (Model 100) for small part cleaning requiring average energy levels. Dimensions of the tank (stainless steel) are 9¼ x 6 x 5 in. Capacity is 2 gallons.

Driving elements cover 25 per cent of the tank bottom. Actual



ALLMETAL
STAINLESS STEEL FASTENERS



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ALLMETAL specializes in all types of stainless steel fasteners; screws, nuts, bolts, washers, rivets, pins, 'AN' fasteners, etc. Batteries of cold headers and automatic screw machines also stand ready to turn out special fasteners to your specifications. A full range of raw material in stock to assure prompt service. Now! Sales offices in the East, Midwest and West for fast local service direct from the manufacturer. Call the ALLMETAL office nearest you—you can often receive the fasteners you need the very next day.

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radiating surface is 12 sq in. The generator (115 volt, single phase, 60 cycle) is designed for continuous operation and delivers an average power output of 60 watts with peaks of 240 watts.

Features: One tube oscillator, front panel switching between two transducers, and three wire ground protection.

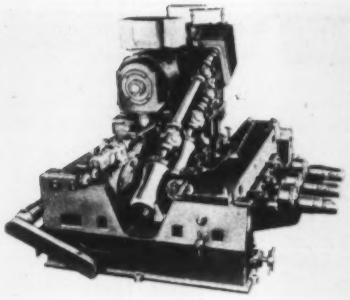
For further information, *write* National Ultrasonic Corp., 111 Montgomery Ave., Irvington, N. J.

Heavy Duty Machine Straightens Big Bars

HEAVY DUTY machines in the Sutton line can do high production straightening of large diameter hot rolled steel bars, alloy heat treated bars, and drill collar stock.

The five roll principle of straightening is used. A central pressure roll is located between two sets of opposed rolls. Each set has one driven roll and one idler roll.

Controls are accessible and all major adjustments are motorized



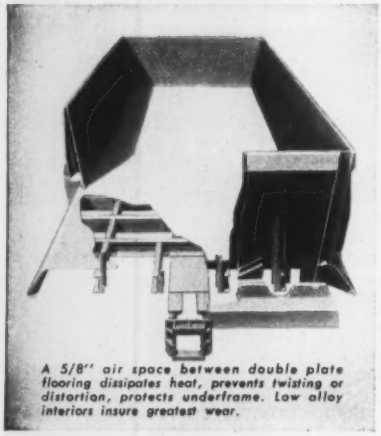
and operated from a control pulpit. Dials indicating roll adjustments are visible to the operator. A heavy duty gear drive uses Sutton universal joints.

Central lubrication is used for points requiring frequent lubrication.

For further information, *write* Sutton Engineering Co., First National Bank Bldg., Pittsburgh 22, Pa.

MAGOR AIR DUMP CARS

FOR STEEL PLANT SERVICE

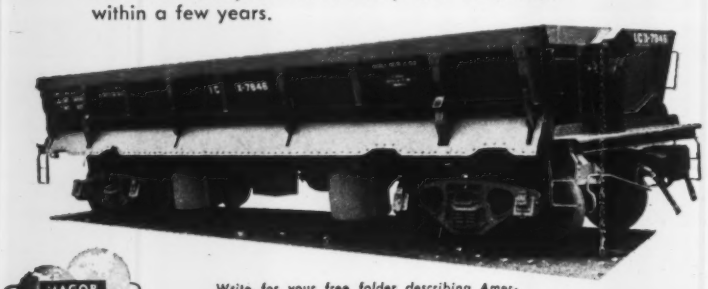


A 5/8" air space between double plate flooring dissipates heat, prevents twisting or distortion, protects underframe. Low alloy interiors insure greatest wear.

The new Magor Air Dump Car for steel plant service can cut your refuse disposal costs as much as 40%! Safe, swift, automatic dumping eliminates expensive labor and crane equipment. Low height and open type body means faster loading. Saves time, labor and haulage costs! Smooth interiors eliminate "dead load" returns!

The double-plate flooring shown here is just one of the many Magor design features that account for Magor's leadership in dump car production. Designed for the job — built to last, Magor Air Dump Cars cost less to buy — less to operate!

Savings effected by the new Magor Air Dump Cars will write off your entire dump car investment within a few years.



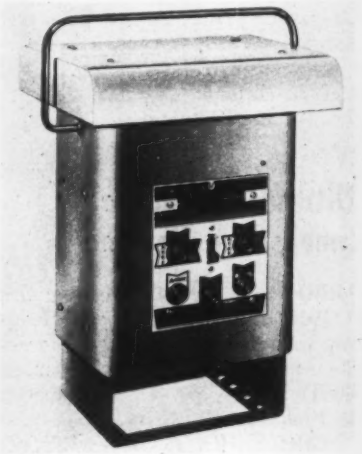
Write for your free folder describing America's number 1 air dump car, today!

MAGOR CAR CORPORATION

50 Church Street
New York 7, N.Y.

Portable Welder Smaller, It Weighs Only 70 lb

THE portable Emerson welder is one-fourth the size of units with comparable output, says the maker. The 70 lb unit is suitable for production welding or tacking.



It has a 60 per cent duty cycle and an 80 open circuit voltage from six conveniently located heat taps (135 through 205 amperes).

A low open circuit voltage feature is optional on the 230 or 460 volt models.

For further information, *write* Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 36, Mo.

Solid bronze, steel or aluminum
Steel lined with bronze, babbitt, copper or aluminum alloy
Plain or ball indented
Oil holes, grooves, slots, notches as required
Straight, clinch butt or special seams
Many lengths and diameters

LOW COST BUSHINGS with Bearing Performance!

Bimetal bushings, in a variety of alloys on steel, provide bearing load-carrying qualities, *with the advantages of low-cost production*. Quality-controlled manufacturing to your specifications. Complete engineering service. Write:

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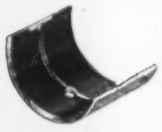
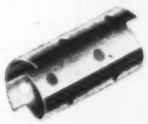
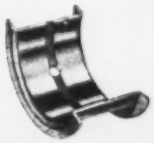


Copper-Alloy Lined



Spacer Tubes

Bearing-Surfaced Thrust Washers



Aluminum or Babbitt Lined

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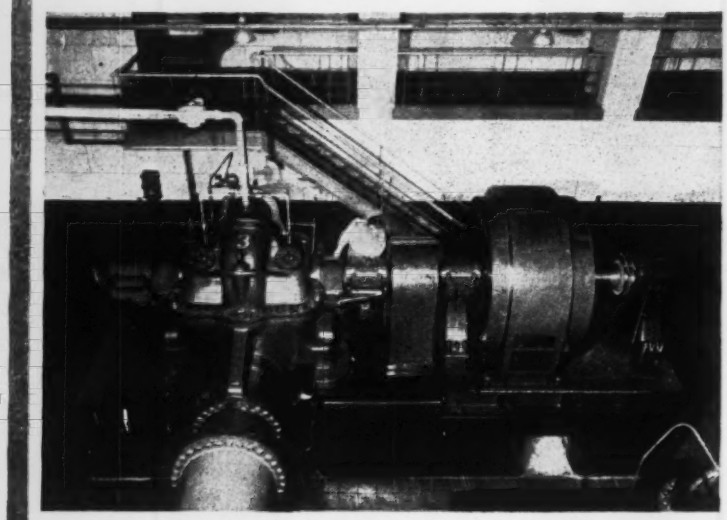
A case for F-M Split-Case Centrifugals!



Typical installation in Toledo averages 80.314% wire-to-water efficiency for year!

Exceptionally high and dependable efficiency with steady, low-cost operation year after year—that's the report from a host of municipalities and industries using Fairbanks-Morse pumps in their pumping stations.

Why? Ask stations like Collins Park High Service in Toledo, O., where five Fairbanks-Morse 36-in. Split-Case Centrifugal Pumps have been giving superb performance for 17 years. The No. 3 pump in the photo pumped 6,065,590,000 gallons in one year alone, handling 26.13 percent of the plant total, and consuming just 3.55 kilowatts hours per million foot gallons!

Your Fairbanks-Morse Field Engineer welcomes you to inspect many other reports like this from his files—reports revealing why no other manufacturer can match the experience of Fairbanks-Morse in providing pumps and drivers for both municipality and industry. Your F-M Field Engineer will be glad to work with your own engineers in selecting the best equipment for your specific requirements. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

See Sweet's Product Design Catalog File for complete F-M Pump Line.

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NEW Literature

Write directly to the company for a copy

High Temperature Belts

A 34 page catalog contains data on metal process belts for high temperature and allied applications. Ashworth Bros. Inc., P. O. Box 278, Winchester, Va.

Barrel Finishing

A seven point system for scientifically controlled barrel finishing is detailed in "Carbotrol 7," a 36 page booklet. Advertising Branch, Carborundum Co., Niagara Falls, N. Y.

Stainless Comparison Chart

A data chart (Sec. A, No. 4) provides a comparison of properties for 18 different grades of stainless steel. Peter A Frasse & Co. Inc., 17 Grand St., New York 13, N. Y.

Speed Reducer Catalog

Single reduction worm gear speed reducers with a new high load capacity thread form and utilizing high strength materials, are described in Catalog 3805. De Laval Steam Turbine Co., Trenton, N. J.

NEW BOOKS

Fabrication of Molybdenum, Book Department, American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. 221 pages, $6.50

Much previously classified material appears in print for the first time in this book. It contains 18 papers presented at an ASM conference in Los Angeles. Techniques covered in the volume include forming, welding, protection, and coating. Each of its chapters is written by a specialist in his field.

Surface Defects in Ingots and Their Products, Iron & Steel Institute, 4 Grosvenor Gardens, London, S.W. 1. 62 pages, $3.50

This book illustrates the many kinds of defects that occur on the surface of ingots, and tells what causes them. It also investigates the influence of surface defects on semifinished and finished products.

A Visit with 500 Die-Casters, American Charcoal Co., 201 S. Green St., Detroit 17, Mich. 450 pages, $10

The latest technical information on all phases of modern diecasting is included in this manual. It treats such things as quality control, die and equipment preventative maintenance, lubrication, plus hundreds of tricks of the trade never before published. Supervised by Ed Day of American Charcoal Co., the book is essentially a compilation of contributions by many of the leading authorities in the diecasting field.

46 x 90 inch Universal Slabbing Mill at the Fontana Works of Kaiser Steel Corporation.

BLAW-KNOX

UNIVERSAL SLABBING MILLS

Blaw-Knox designs and builds slabbing-blooming mills in a complete range of sizes in universal and high lift types. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations and auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Blaw-Knox Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or composite design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

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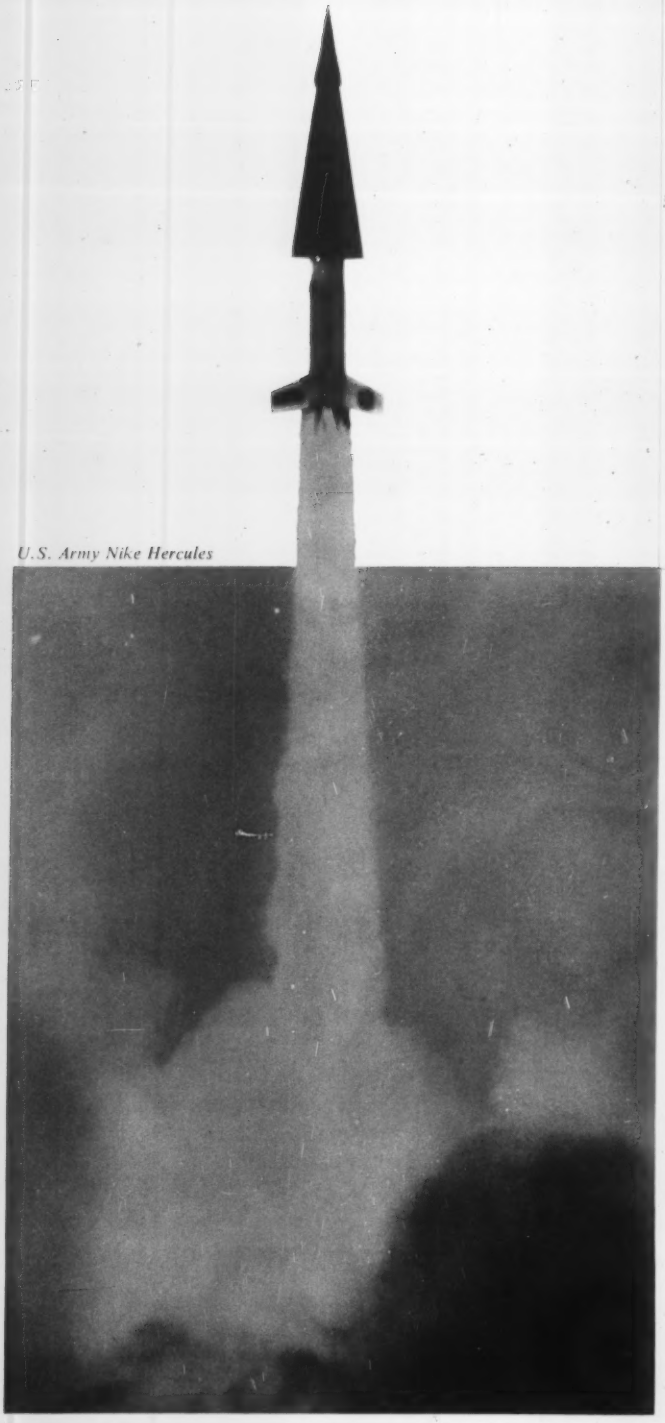

U.S. Army Nike Hercules

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Steelmakers Wince as Automakers Cry

STEEL COMPANIES, the United Steelworkers of America, and the industry's best customer (automakers) are engaged in a free-for-all wrestling match with the whole world as spectators.

Question: Will Uncle Sam ring the bell in time to save the auto industry from being thrown out of the ring? Answer: Probably not.

Even if the Supreme Court rules in favor of a Taft-Hartley injunction and steelworkers return to their jobs immediately, shipments won't reach a significant volume until early December. That won't be soon enough to forestall shutdowns at almost all Ford Motor Co. and Chrysler Corp. plants. By the time steel is flowing again, even the well stocked Little Two will be in trouble.

STRIKE HALVES OUTPUT— Because of the steel strike, automakers figure they'll produce only 278,000 cars this month. That's less than half of what they intended to turn out and 45 per cent less than they built last month. GM's Fisher Body Div. has only two of its 30 plants operating. Ford and Chrysler are staggering schedules and readjusting steel stocks to keep going.

GAMBLE PAYS OFF— Even though it had a three month supply of steel when the strike started, American Motors Corp. decided that wasn't enough. The walkout was only a few weeks old when AMC buyers started combing the country for another 30 days' stock (enough to build 40,000 cars). They got it but it came high—$25 to $100 a ton over the usual prices. The gamble paid off. AMC is running close to capacity as competitors cut schedules or close doors.

SELLER'S MARKET— Structural fabricators find that they too can get what they need if they're willing to pay for it. Case in point: Pittsburgh firms are being offered plain material by New York brokers at 12.5 cents a pound, f.o.b.—which means 13.25 cents, Pittsburgh. In normal times, they can buy from the mills at 6.5 cents delivered or from service centers at 9 cents.

NO QUESTIONS ASKED— At Boston and other ports, entrepreneurs are snapping up foreign steel as it comes in and making no bones about charging whatever the traffic will bear. Buyers don't object too strenuously when they know they can pass the higher costs along.

TAKE WHAT'S AVAILABLE— Bar consumers are searching the service centers for tonnage that can be shipped immediately. Many are willing to accept substitutes (larger sizes, richer alloys) because: 1. They know that stocks will get tighter. 2. It may be several weeks after steelmaking resumes before they can balance their inventories.

TUBEMAKERS' DILEMMA— Oil country goods producers are wondering how they can restock their distributors in the Kansas City area during the winter.

If steel production resumes under an injunction, they'll have no problem. Most users, fearing another strike, will probably specify shipment by the fastest means. If the strike is terminated by a new contract, producers will have to ship to K. C. by rail or truck during the winter and absorb extra freight themselves. If they don't, they'll be frozen out of the market even after the ice melts.

PRODUCTION STEADY— Last week, steelmakers operated their furnaces at 13.5 per cent of capacity, 0.4 point above the previous week's revised rate. Production: About 382,000 ingot tons.

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*Current prices were published in the Nov. 2 issue and will appear in subsequent issues.

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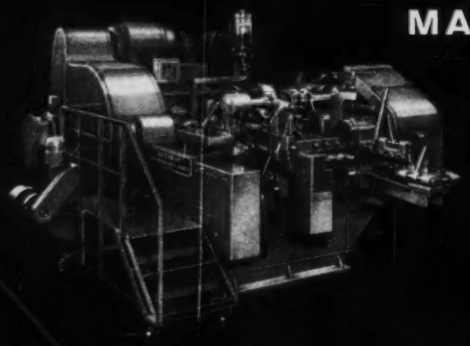

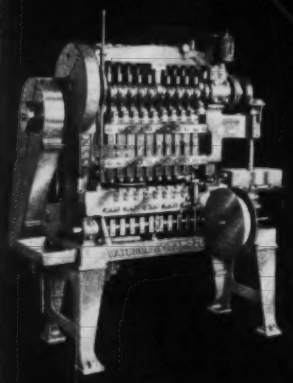

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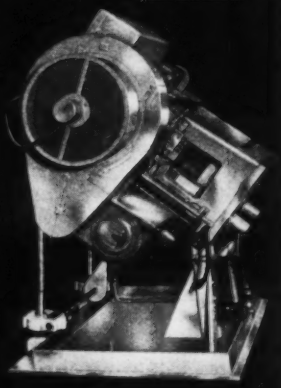

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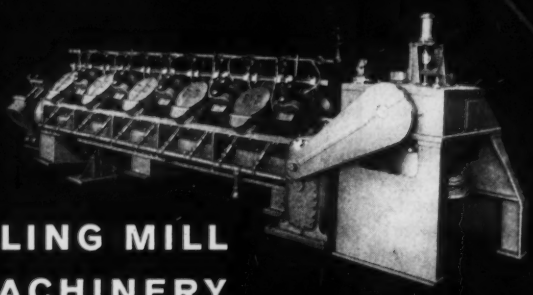

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WF-55

Next Congress Faces New Stockpile Hassle

EVER since the government's present stockpiling policy was adopted, it has been hotly attacked and stoutly defended. As the debate continues, industry wonders if the policy will be maintained, altered, or scrapped when the second session of the 86th Congress convenes in January.

• **Soul Searching**—To get an idea of what to expect, STEEL checked Office of Civil & Defense Mobilization records and talked with OCDM officials. Also consulted were several members of Congress and staff members of committees intimately connected with the future of the program.

Caught in the middle, OCDM is attempting to keep everyone happy by finding a rational explanation for maintaining as much as possible of the stockpile we now have, and obtaining permission to sell some of the more obviously unneeded items (see exhibit).

• **Two Way Approach**—The official position of the agency is that it is "studying the postattack period to find if present surpluses might not be needed for rehabilitation." On the other hand, it is preparing legislative recommendations for the next session of Congress. Under the proposals, OCDM would be allowed to give 90 days' notice of a proposed sale (rather than six months as is now the rule) and the proposed sale would take effect automatically unless vetoed by Congress within a specified period.

The current hassle over the program was brought about by the Pettibone Committee's report in 1958, which lowered the basic objectives of the stockpile from a five year to a three year supply of strategic items.

• **Current Status**—OCDM thus has an excess of almost $3 billion worth of metals and materials in the so-called Group I items, which include 75 products from abrasives to zinc. Value of the strategic stockpile is $5.8 billion, based on June 30, 1959, market prices. Another $1.2 billion is held in other government inventories.

Fifty-five of the 75 items are stocked up to the basic objectives established by OCDM. Sixty-seven have reached the maximum objectives. The basic objective includes the possibility of the U. S. receiving imports of strategic materials from friendly overseas suppliers. The maximum objective assumes suppliers overseas (except those in this hemisphere) would be cut off by enemy action.

• **Shifting Strategy**—Since World War II, we have undergone several distinct shifts in planning for a new emergency. Three steps have influenced our stockpile policies.

First, we planned for an all-out mobilization effort, which would require a five year stockpile. Then, high government officials accepted the basically Air Force concept that another emergency would involve all-out thermonuclear war. So we cut our planning to three year objectives.

Today, OCDM is seriously considering the possibility that enough of the population and enough of our industrial might would remain after an atomic war to need rehabilitation.

Says J. Roy Price, assistant director, OCDM: "We will not know completely where we stand until we have finished evaluating the requirements for postattack recovery."

For that reason, OCDM says present disposals of titanium, rubber, and zirconium ores are insignificant, and the materials generally do not meet quality standards anyway.

• **Black Box Answer**—OCDM has taken all its headaches about the stockpile and its relations to overall civil defense and programed them

Materials Needed for the Stockpile*

Jewel bearings **Small diamond dies** **Chrysotile asbestos**

*OCDM will purchase these items during the rest of fiscal 1960. In addition, money is provided for upgrading tungsten to tungsten carbide powder and molybdenum to molybdic oxide. The agency will spend $9.2 million in fiscal 1960 (vs. about $8.8 million last fiscal year) for such purchases and upgrading.

Materials Which Are Surplus†

†Equal or exceed the maximum objective of the stockpile

Abrasives	**Aluminum**	**Crocidolite asbestos**
Bauxite (except Surinam)	**Beryl**	**Bismuth**
Cadmium	**Castor Oil**	**Celestite**
Chromite (except chemical grade)	**Cobalt**	**Columbite**
Copper	**Diamonds (crushing bort)**	**Feathers and down**
Fluorspar	**Graphite**	**Hyoscine**
Lead	**Magnesium**	**Manganese (except chemical grade, Type B ore)**
Mercury	**Mica (Muscovite and Phlogopite splittings)**	**Molybdenum**
Nickel	**Opium**	**Platinum**
Pyrethrum	**Quartz crystals**	**Quinidine**
Rare earths	**Rubber**	**Crude silicon carbide**
Silk	**Sperm oil**	**Tantalite**
Tin	**Tungsten**	**Vanadium**
Vegetable extracts	**Zinc**	

into a national damage assessment center at a secret site. Attack patterns are being fed into computers to develop damage estimates and requirements for the postattack period.

"So complex are these computations, it is probable that about a year will pass before this phase of our study is completed," says Mr. Price.

Generally, OCDM plans to establish two principal accounts for its strategic materials (which are spread among the Defense Production Act inventory, the supplemental stockpile, the Commodity Credit Corp. inventory, and the General Services Administration tin inventory). The first account will be material not in excess of objectives; the second will be a reserve.

• **Confusing the Market**—Two cases indicate the disposal problem from OCDM's point of view. Two years ago, long staple cotton was surplus and the market could have absorbed it. Today, coconut oil is surplus and badly needed because of crop failures. In both cases, OCDM could not sell until six months after announcing its intention to sell. The market situation can change drastically during the waiting period.

Some congressmen want a special committee of businessmen to help OCDM find a solution and guide the agency's disposal plans to avoid unnecessarily disturbing the markets.

• **What Congress Will Do**—Capitol Hill sources have told STEEL that OCDM will not get permission to sell within 90 days of the announcement of intention, nor will it have the right to sell without an express O.K. from Congress.

The western delegations are heavily involved in the situation. Action of OCDM against lead and zinc stockpiling in the last several years, and the recent decisions by the agency to not grant relief under Section 8 of the Trade Agreements Act to cobalt and fluorspar producers have not built up sentiment in favor of relinquishing further power to the agency.

The storm caused last spring by the hint of a copper sale is enough to warn OCDM of the hard struggle it has ahead.

Consumers Support Steel Mills in Labor Struggle

Midwestern steel consumers are exerting little pressure on the mills to settle "at any cost." They are running out of steel and are being obliged to curtail operations, but indicate they prefer to accept their portion of the "hurt" rather than have the steel companies lose the battle with the union. The issues are too fundamental, they say.

Steel companies which are still running, either because they were not struck or have signed temporary agreements with the union, report full order books for the rest of 1959. They had expected some slip in orders because they figured consumers would be running out of some types of steel and would be obliged to reduce their intake of available types.

Consumers won't be able to build up their inventories to any extent until about mid-1960. Reason: All available production will be required to maintain current metalworking operations, and some steel plants probably won't accelerate

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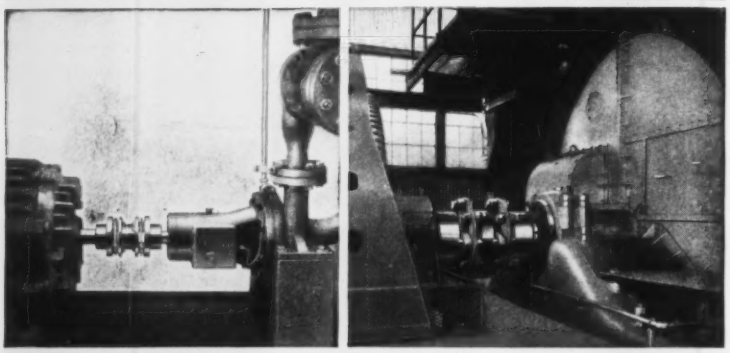

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much in the first three weeks of resumed operation. During the first six months of 1960, the mills expect to sell every pound they can produce.

Wire . . .

Wire Prices, Pages 207 & 208

Wire rod shortages will hamper manufacturing operations for some time after strikebound wire mills resume production. Converters' stocks are low and out of balance, notably on the specialties and high carbon material.

Until recently, the converters supplied these grades in volume to avoid critical cutbacks, but the supply situation of more consumers is becoming serious.

Rod supplies of strikebound mills are not impressive. It'll take them some time to clear out backed up orders after production is resumed.

Tubular Goods . . .

Tubular Goods Prices, Page 209

Because of the strike, Youngstown Sheet & Tube Co., Youngstown, lost an order for 4650 tons of 20 in. OD pipe for a Gulf Coast pipeline to a German producer. The price difference was about $50 a ton.

Youngstown booked the order and scheduled rolling at its Brier Hill Works electricweld pipe mill. When it became apparent the company couldn't meet the delivery required because of the strike, the pipeline firm canceled the order.

Sheet & Tube says it is the largest order it has lost to foreign competitors, although they are regularly underselling the U. S. company on some types of steel.

Oil drilling operations climbed in the week ended Oct. 26, the Hughes Tool Co. survey reveals—it showed 2096 rotary rigs at work, 68 more than in the preceding week and 82 more than in the like week a year ago.

Oil country goods producers wonder how they'll restock their distributors in the Kansas City area this winter. It's too late for barge shipments, and higher costs discourage use of rail or truck transportation.

If steel production resumes under an 80 day injunction, tubemakers won't have to wrestle with this dilemma. They're sure that most customers, fearing another strike when the injunction expires, will specify direct shipment by whatever means is available—regardless of cost. Users will try to take in enough steel to carry them through an assumed second strike.

Should the strike be terminated by the signing of a new contract, steelmakers will have to ship by rail or truck during the winter and absorb freight costs that are in excess of barge rates. If they don't, they're likely to be frozen out of the market even after the ice melts.

For the most part, tube users are adequately stocked. It's apparent they're in much better shape than sheet, plate, and structural consumers. Items in relatively short supply include 2 in. tubing and 4½ and 5½-in. casing.

Demand for drill pipe remains sluggish. Ironically, it's the one product that will be immediately available from mill stocks when the strike ends.

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problems will limit the poststrike output of tubemakers for several weeks, they probably won't be able to satisfy the pentup demand for their products before April or May. Customers will be allotted tonnage on the basis of their previous buying habits. And if operating problems curtail output, they'll get a correspondingly reduced allotment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 206

While reinforcing bars and other construction steel items continue to move at a fast clip, a seasonal slackening is developing at some points. Many buyers are out of bars and are pressing mills still operating for shipments. Wire mesh is under less pressure with the end of the building season approaching.

The average unit price for reinforcing steel bars paid by California in the latest quarter for its highway and public works requirements averaged out at 13.4 cents a pound. In the previous quarter, the average was 10.8 cents.

Steel Bars . . .

Bar Prices, Page 205

Consumers of hot rolled steel bars are scouring the market for prompt shipment tonnage. Many are willing to accept substitute specifications, especially where larger sizes and richer alloys are available. They realize the supply will get tighter before it gets easier and that it will probably be several weeks after the strikers return to their jobs before tonnage will begin to flow from the mills in heavy volume.

Several large consuming plants have avoided curtailment in operations by machining down odd sizes originally specified for other uses.

The supply outlook in the cold drawn bar market is a little more promising than in hot rolled, particularly because some of the large captive cold drawing shops had substantial stocks on hand when they were forced to suspend by the strike last summer.

Government orders for bars are gradually mounting. Jones & Laughlin Steel Corp., Pittsburgh, has booked 440 tons from the Navy Supply Depot, Philadelphia, and the ordnance plant at Macon, Ga. Wyckoff Steel Co., Pittsburgh, booked 105 tons of cold finished

bars from the Raritan (N. J.) Arsenal. Those and previous orders will be given priority in rolling schedules.

Kaiser Resumption Slowed By Furnace Repairs

Kaiser Steel Corp. tapped its first heat of open hearth steel Oct. 30 after a 105 day shutdown at its Fontana, Calif., plant. More than 1000 employees were called back to work for the first shift, and the company hoped to have 6000 of its 7200 work force on the job within a week or so.

Four of Fontana's nine furnaces were in bad shape, reports a company spokesman. Brick linings on one are being completely rebuilt, and the other three are having holes patched. The three oxygen process furnaces were said to be in good shape.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 206 & 207

Cutbacks in metalworking operations are spreading as plants run out of sheets, strip, bars, and other major steel products. Many of the large users of sheets have just about exhausted their supplies. The shutdown of auto plants is starting to affect smaller industries; component plants are beginning to grind to a halt.

The chain reaction will get worse, even if the mills resume production right away.

The pinch in sheet steel is particularly severe. Warehouse stocks are being rapidly depleted, and imports are filling only a small portion of needs. New conversion deals, mostly sheets, have about run their course with few such opportunities to pick up needed tonnage left.

Sheetmakers say they have enough work ahead of them to keep their plants operating fully for six months after production is resumed. Included are set-asides as well as formally acknowledged orders, particularly for hot and cold rolled and galvanized sheets. The outlook in specialties, such as electrical sheets and enameling stock, is somewhat better than in other grades.

At least one unstruck producer of hot and cold rolled sheets is

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Southwest Welding & Mfg. Division,
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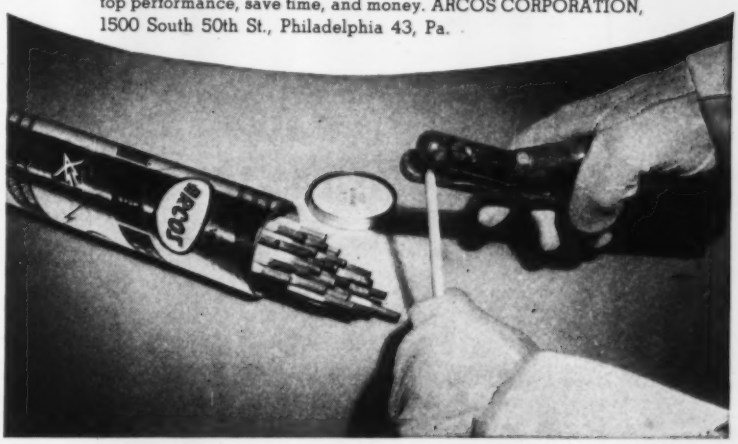

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running a month behind on delivery commitments. It is accepting orders for first quarter, but has blanked out January production to work off backed up tonnage. It is not scheduling shipments beyond the first quarter.

Prices on Imported Steel Items Continue to Go Up

Rising prices on imported steel products, and increased speculation that the foreign mills may concentrate on other than U. S. markets after American production is in full swing again, may ease the import pressure on the Texas market over the next couple of months.

A leading Texas mill is heavily booked for the poststrike period. Demand for wire products is up sharply; nail bookings are above normal. That is an encouraging development for this producer who has long battled against low price foreign steel—especially wire products.

While there's talk that western European mills will divert to other markets to escape cutting their prices again when the U. S. returns to full production, many domestic trade leaders are skeptical. They point to heavy imports since July—almost 200,000 tons for Texas in the July-September period. The influx, coupled with heavy prestrike stockpiling, has meant few critical shortages in the area despite the steel strike.

Foreign mill prices are still rising. A Belgium - French - Luxembourg combine quoted higher prices last week. Most items went up 5 cents a hundred pounds, but some advanced as much as 14 cents. Comparison of foreign lists with U. S. quotations shows that most imported items are still slightly under domestic mill prices. For example, angles are 88 cents lower, I-beams, 71 cents, reinforcing bars, 47 cents.

Plates . . .

Plate Prices, Page 205

Some producers of large sheared plates have enough business in hand to support operations five to six months after steelmaking operations are resumed. Should the strikers return to work soon, one eastern plate mill will be able to offer delivery on heads in six to eight weeks, and on clad steel and alloys, in eight to nine weeks. One producer who has been operating throughout the strike is running about three weeks behind on delivery commitments.

The bulk of heavy weldment tonnage in New England has been booked by nonintegrated shops over the last three months. They are now low on plates, and some fabricated work will miss delivery promises. Integrated shops have small backlogs and will operate well under capacity for some time. Heavy and wide plates will not be available in volume for some time.

Distributors . . .

Prices, Page 210

Service center operators look for a decline in business this month due to widening gaps in their stocks. Many have exhausted their supplies of several products. The downtrend in bookings will continue until stocks can be replenished from mills. Producers that are still operating are swamped with inquiries and are running well behind on commitments, delaying shipments to some distributors.

October trading was limited somewhat by the shrinkage of inventories, but the over-all volume was good. One leading distributor in the Philadelphia district reports that business last month was surpassed only by that in August and even then by not much.

Distributors report many requests for substitutions involving size and analysis.

In a few areas, particularly in the Southwest, a wide range of material has been restocked with imported steel. Distributors in the Houston district say the heavy tonnages of foreign steel that are available have tended to restrict demand for domestic products.

Pig Iron . . .

Pig Iron Prices, Page 210

Merchant pig iron producers are disturbed by the influx of Russian iron. Most serious effects are seen in markets served by producers along the Atlantic Seaboard and in the Great Lakes area.

A test lot of 3000 tons of foundry iron has been brought to North America, including 2500 tons at Detroit and 500 tons at Montreal, Que. Budd Co. purchased 600 tons for consumption in the Detroit area, while a Buffalo plant received eight carloads (about 370 gross tons).

The importer is Primary Industries Corp., 120 Wall St., New York, N. Y. Additional imports of Russian iron are pending tests.

With domestic supplies of pig iron plentiful, indications are the Russian iron is being purchased solely for a price advantage. Foundries are operating at a fairly good level and are having no difficulty in obtaining necessary tonnages of raw materials. The chain reaction of the steel strike may soon cut into demand for castings, especially from the automotive industry, which is curtailing operations.

Troy, N. Y., will become the lowest basing point for most New England pig iron users when stocks are exhausted at the closed Mystic furnace at Everett, Mass. No. 2 foundry iron can be delivered from Troy to Boston at $76.35, a ton including $7.85 freight. The freight rate to Boston from Swedeland, Pa., is $9.89; from Buffalo $12. Iron stored for shipment from Beacon, N. Y., will be closer to the Troy delivered price. Stocks at Everett will last for at least two months before shortages begin to appear in some foundry grades.

Structural Shapes . . .

Structural Shape Prices, Page 205

With structural steel demand slow, especially for industrial and commercial projects, fabricators are competing sharply for new work despite the uncertain outlook for steel supplies. Prices on fabricated material are the lowest of the year.

Fabricators whose shops have not been closed by the strike report their stocks of wide flange sections are depleted. Most claim they still have fair inventories of standard shapes and plates. All shops have reduced schedules in some degree because of the shortage of steel. Some are down completely.

Fabricating cycles at structural shops are disrupted, and with deliveries on plain material more extended, delays in shipping fabricated steel next spring are certain. Construction projects are being suspended at various points for lack of steel. That means new fabricating work will be delayed until stalled tonnage is worked out of schedules.

Several structural jobs are up for

early action in the Pacific Northwest, including 1000 tons for the John Day Dam (bids Nov. 19), more than 2000 tons for missile bases in central Washington (bids Nov. 18), and 600 tons for an Oregon state bridge (bids Nov. 3).

California paid an average unit price for structural steel of 19.8 cents a pound for its highway and public works jobs in the latest quarter vs. 16.5 cents in the preceding three months. The state used 2500 tons in the period ended June 30 with the prices of significant quantities ranging from 11 cents to 21 cents a pound. About half the projects using structurals had a total value of less than $100,000.

One Pittsburgh area fabricator estimates its steel inventory is down to one-third of the prestrike level. Another estimates its stock is down 40 per cent. Some district shops are taking jobs against steel awaiting shipment at mills.

Plain material can be obtained from the Atlantic seaboard, but prices delivered to Pittsburgh are prohibitive. East Coast brokers are quoting 12.5 cents a pound f.o.b., which means 13.25 cents, Pittsburgh. Normally, users can buy from district mills at 6.5 cents delivered.

Kaiser Steel Corp.'s Montebello (Calif.) fabricating plant is in full production following its agreement with the United Steelworkers.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

600 tons, glass fiber plant, Pittsburgh Plate Glass Co., Shelby, N. C., to Southern Engineering Co., Charlotte, N. C.; Daniel Construction Co., Greenville, S. C., general contractor.

500 tons, structurals and reinforcing, manufacturing plant, Raytheon Mfg. Co., Portsmouth, R. I., to Macomber Inc., Canton, Ohio (structurals) and Plantations Steel Co., Providence, R. I. (reinforcing bars); Dimeo Construction Co., Providence, general contractor.

350 tons, including joists, plant addition, St. Joseph Paper Co., Newark, N. J., to Belmont Iron Works, Eddystone, Pa.

230 tons, state highway bridge, Falmouth, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Wyman & Simpson Inc., Augusta, Maine, general contractor.

213 tons, women's dormitory, Furman University, Greenville, S. C., to Bibb Steel & Supply Co., Macon, Ga.; A. C. Stamford Inc., Albany, Ga., general contractor.

185 tons, addition, Wesson Maternity Hospital, Springfield, Mass., to Haarman Steel Co., Holyoke, Mass.; Daniel O'Connell's Sons Inc., Springfield, Mass., general contractor; 57 tons of reinforcing bars to Scherer Steel Co., Hartford, Conn.

100 tons, structurals and reinforcing bars, manufacturing building, Waveco Corp., Burlington, Mass., to West End Iron Works, Cambridge, Mass. (structurals), and Concrete Steel Co., Boston (reinforcing bars); Vappi & Co. Inc., Boston, general contractor.

STRUCTURAL STEEL PENDING

2000 tons or more, three missile launcher facilities, near Larson Air Base, Washington State; bids to U. S. Engineer, Walla Walla, Wash., Nov. 18.

500 tons, also 200 tons of reinforcing bars, main structure, Exposition Century 21, Seattle; bids during November.

500 tons, Hopkins Center buildings, Dartmouth College, Hanover, N. H., John A. Volpe Construction Co., Malden, Mass., general contractor.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3500 tons, Museum of History & Technology, Smithsonian Institution, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; Norair Engineering Corp., Washington, general contractor.

600 tons, substructure, bridge, Merrimack River, Lawrence, Mass., to U. S. Steel Supply Div., U. S. Steel Corp., Pittsburgh; J. F. White Contracting Co., Westwood, Mass., general contractor; 2025 tons, steel piles, and 270 tons, sheet piling, to Bethlehem Steel Co., Bethlehem, Pa.

404 tons, women's dormitory, Furman University, Greenville, S. C., to Southern Steel Products of Carolina Inc., Gastonia, N. C.; A. C. Stamford Inc., Albany, Ga., general contractor.

205 tons, high school, Bourne, Mass., to Plantations Steel Co., Providence, R. I.; Theodore Loranger & Sons, New Bedford, Mass., general contractor; structural steel to Providence Steel & Iron Co.

200 tons, General Stores Supply Office, Navy, Philadelphia, to Jones & Laughlin Steel Corp., Pittsburgh.

150 tons, Seattle-Tacoma freeway bridge, Washington State project, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Lige Dickson Co., Tacoma, Wash., general contractor at $1,387,124.

120 tons, highway bridge (state) at Falmouth, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Wyman & Simpson Inc., Augusta, Maine, general contractor.

100 tons or more, addition, research facilities, Talmadge Memorial Hospital, Augusta, Ga., to Southern General Fireproof Co., Atlanta, Ga.; Beers Construction Co., Atlanta, general contractor.

60 tons, Nooksack Dam for Bellingham, Wash., to Pacific Coast Div., Bethlehem Steel Co., Seattle.

REINFORCING BARS PENDING

2000 tons or more, missile project, Larson Air Base, Washington State; bids to U. S. Engineer, Walla Walla, Wash., Nov. 18.

100 tons, 290 ft concrete bridge, Idaho County, Idaho; bids soon to Bureau of Public Roads, Portland, Oreg.

100 tons or more, exhaust air contamination facilities, Hanford Works; R. B. Miles Construction Co., Mercer Island, Wash., low at $1,698,866 to Atomic Energy Commission.

100 tons or more, Montana State 153 ft overpass, Yellowstone County; Long Construction Co., Billings, Mont., low bidder.

100 tons or more, Montana State 168 ft overpass, Toole County; Baltrusch Construction Co., Havre, low at $73,829.

PLATES . . .

PLATES PLACED

207 tons, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

PLATES PENDING

1000 tons or more, elevated watertank, Portland, Oreg.; bid call postponed indefinitely.

300 tons, 750,000 gallon elevated watertank; Graver Tank & Mfg. Co., Seattle, low bid at $144,276 to Renton, Wash.

PIPE . . .

STEEL PIPE PENDING

Unstated, 4936 ft of 12 in. steel water pipe; bids to Vancouver, Wash., Nov. 12; materials furnished by the city.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

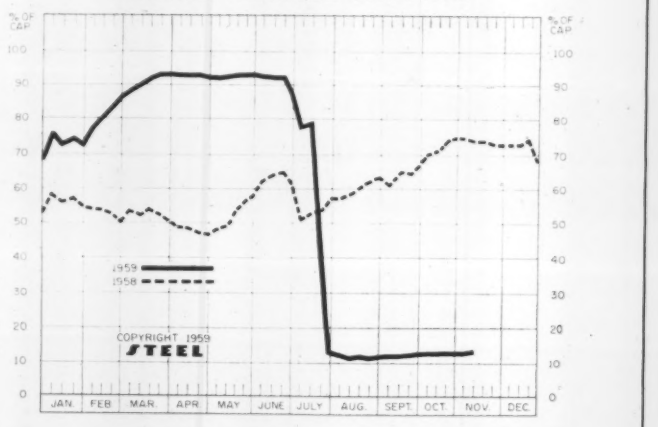
	Week Ended Nov. 8	Change	Same Week 1958	Same Week 1957
Pittsburgh	2	0	69.5	81.5
Chicago	5.5	— 0.5*	83	80
Eastern	13	0	72	83
Youngstown	9	0	64	66
Wheeling	57.5	+ 1	84.5	71
Cleveland	6	0	79	85.5
Buffalo	4	0	75.5	90
Birmingham	9.5	+ 0.5	60	67
Cincinnati	70.5	0*	86.5	80
St. Louis	61	— 4.5*	96	91
Detroit	23.5	0	85.5	94.5
Western	18	+12.5	78	91
National Rate	13.5	+ 0.4*	74.5	79

INGOT PRODUCTION

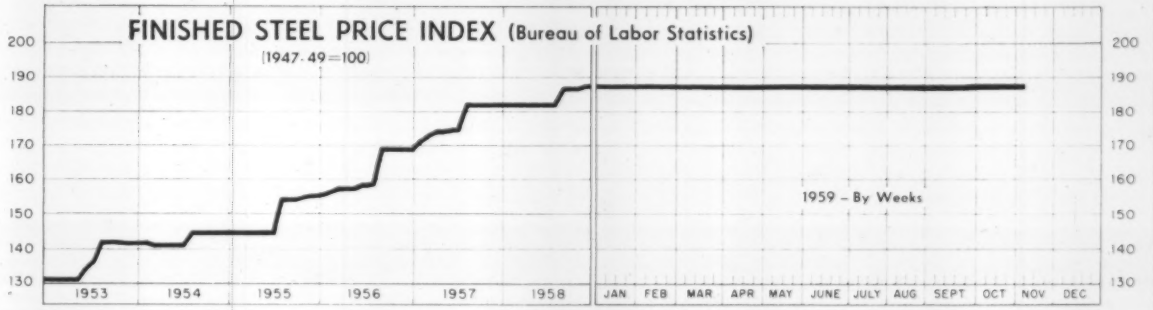
	Week Ended Nov. 8	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	23.8†	23.1	22.5	125.2
NET TONS (In thousands)	382†	371	362	2,011

*Change from preceding week's revised rate.
†Estimated by STEEL; comparative figures reported by AISI.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Nov. 3, 1959	Week Ago	Month Ago	Oct. Index	Year Ago
186.8	186.8	186.8	186.8	186.2

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 3

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.735
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.420
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	27.005	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.742
		Woven Wire Fence (20-rod roll)	21.765

STEEL's FINISHED STEEL PRICE INDEX*

	Nov. 4 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	247.82	194.53
Index in cents per lb	6.713	6.713	6.713	6.713	5.270

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.96	$117.95
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	45.33	44.33	43.00	42.33	33.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Nov. 4 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld. Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb)box,Pitts.	$10.65	$10.65	$10.65	$10.30	$9.05

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods ½-⅝" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton

	Nov. 4 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.58
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$45.50	$44.50	$44.50	$44.50	$34.50
No. 1 Heavy Melt, E. Pa.	45.00	45.00	44.00	40.00	33.50
No. 1 Heavy Melt, Chicago	45.50	43.50	40.50	42.50	33.00
No. 1 Heavy Melt, Valley	44.50	44.50	44.50	43.50	35.50
No. 1 Heavy Melt, Cleve.	41.50	41.50	41.50	40.00	33.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	35.50	30.50
Rails, Rerolling, Chicago	64.50	64.50	64.50	62.00	54.50
No. 1 Cast, Chicago	57.50	57.50	56.50	45.50	39.50

COKE, Net Ton

Beehive, Furn., Connisvl.	$15.00	$15.00	$15.00	$15.25	$13.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Over 1,000,000 Americans cured of cancer! Enough to fill the famous Rose Bowl ten times over. All of them alive and well because five, ten or even twenty years ago they went to their doctors in time.

In a single generation, cancer's cure-rate has been raised to one-in-three saved from one-in-seven saved...largely due to the trail-blazing programs of the **American Cancer Society.**

To learn how to guard yourself and your family against cancer, call our nearest office or write to "**Cancer**" in care of your local post office.

Steel Prices

Mill prices as reported to STEEL, Nov. 4, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 206; footnotes, page 208.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ..80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ..109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ...109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ...140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 .....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 .....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14 119.00
S.Duquesne,Pa. U5 ...119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1 ..6.40
Johnstown,Pa. B2 .....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1.5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14 5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 .....6.45
IndianaHarbor,Ind. I-2 ..5.50
Lackawanna,N.Y. B2 .....5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 .....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W16 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1.8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ....5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ....6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 .....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1 5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairtown,Pa. U5 .....7.95
Claymont,Del. C22 .....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1.7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2...7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshocken,Pa. A3 ...6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsbugh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..5.55
Ashland l.c.l. (15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton, Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O.(23) R2 .....6.15
Clairton,Pa. (9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ..5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1 5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P2 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ...5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ...6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11.6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 .....5.675
Tonawanda,N.Y. B12..5.675
Torrance,Calif.(9) C11.6.375
Warren,O. C17 .....6.052
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 .6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.275
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 .....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 .....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14 8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ....5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco 87 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Loaded
(Including loaded extra)
Carbon
LosAngeles P2, S80 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ..7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2 9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ...7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 .....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 .....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ..7.65

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md.(5) C19.6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2 .9.025
Hartford,Conn. R2 .....9.325
Harvey,Ill. R5 .....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ....11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 .....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2,Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 .6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ..5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ....6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(8.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(8.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ...19.80
McK.Rks.(Staybolt)L5. 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2.5.575
ChicagoHts.(4)(44) I-2.5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.575
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 ....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 .6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2 .6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill. G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2.6.875‡
Ashland,Ky. A10 ....6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ..6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ...8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel ofN.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copprweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala. (27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky. (8) A10 ...5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ...5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 .....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 .....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 .....8.40
S.Chicago,Ill. W14 .....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 .....7.575
S.SanFrancisco(25) B3..8.325
SparrowsPoint,Md. B2..7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10 ...5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. W10 .7.425
Fontana,Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ...7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5..7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6.7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 .....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. S18 .....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 .....7.525*
McKeesport,Pa. E10 ...7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1..7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET Dollars per 100 lb)			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, Hot Dipped Common Coke	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.20
GraniteCity,Ill. G4 .....8.30
Ind.Harbor,Ind. I-2, Y1.8.20
Irvin,Pa. U5 .....8.20
Niles,O. R2 .....8.20
Pittsburg,Calif. C11 ....8.85
SparrowsPoint,Md. B2 ..8.20
Weirton,W.Va. W6 ....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 .....7.95
Ind.Harbor,Ind. Y1 ....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$10.05
Irvin,Pa. U5 .....10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65
					Stator
Vandergrift,Pa. U5					8.10
Mansfield,O. E6					8.10
Warren,O. R2 (Silicon Lowcore)					8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ...8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16 ..8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 .....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

Wire, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ....12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ..12.95
Palmer,Mass. W12 .....13.70
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 .....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ..13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donorra,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ..10.05
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ...9.85
Struthers,O. Y1 .....9.75
Trenton,N. J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6..10.05
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ...9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6.10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ...16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C16 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 ....16.60
S.SanFrancisco C10 ...17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 .....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 ....13.70
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 .....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ...13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 ....13.75
(A) Plow and Mild Plow; add 0.25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7, T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.34

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.28
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.64

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.69

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa. 9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)

	An'ld Galv. Stone	Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville B8	17.95	19.80†‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80†‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80†‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
KansCity(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(37)(48)	N15 9.10 9.80
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass. A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. (ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam	43.0
1⅛ and 1¼ in. diam	34.0

NUTS
(Keg or case quantity and over)
Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)
Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0

Longer than 6 in.:

⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0

Longer than 6 in.:

⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¼	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	15.35
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.75	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.53	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.10	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	69.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry. K2	89.00
Keokuk, Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]	Shapes	Carbon	Floor
Atlanta	8.59§	9.86‡	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	9.80[a]	10.00[b]	9.99	....	11.45[c]	10.05[d]	11.80#	16.38	9.55	9.90[e]	10.50
Birmingham	9.43[a]	10.20[b]	....	....	10.91[c]	9.59[d]	13.14#	16.76	9.00	9.79[e]	10.90
Boston	10.07	11.42	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.58#	15.37	9.56	9.27	10.53
Cleveland	8.54[a]	8.79[b]	10.87	52.33	10.32[c]	8.75[d]	11.25#	15.16	9.39	8.71[e]	10.50[f]
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	9.65[a]	9.65[b]	....	52.00	10.85[c]	8.90[d]	13.10#	16.55	8.35	9.65[e]	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.82[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.54[a]	8.79[b]	10.76	52.33	10.30[c]	8.64[d]	11.25#	15.05	9.00	8.47[e]	10.26[f]
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.80[a]	9.31[b]	10.47	....	10.32[c]	8.70[d]	11.49#	16.54	9.38	8.60[e]	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡⅝ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

[a]10 Ga.; [b]20 Ga.; [c]½ x 1 in.; [d]⅝-2½ in.; [e]¼ x 84 in.; [f]¼ x 36 in.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $26.50-$27; barge, Brownsville, Tex., $29-$29.50.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00†
Brazilian iron ore, 68.5%	21.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$16.00-$16.50*
Domestic, concentrates f.o.b. milling points	22.00-23.00

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 88-90c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$34.00-35.00†
48% no ratio	25.00-26.00†

South African Transvaal

44% no ratio	18.00†
48% no ratio	24.00-26.00†

Turkish

48% 3:1	36.00-37.00†

Domestic

Rail nearest seller

18% 3:1	30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.50
100 mesh, pails	9.85‡
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ¼ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe.	36.75
Unannealed (99+% Fe)	33.25
Unannealed (99+% Fe) (minus 325 mesh)	58.25
Powder Flake (minus 16 plus 100 mesh).	29.25
Carbonyl Iron:	
98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	*35.70-52.20†*
Bronze, 5000-lb lots	*53.50-57.50†*
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 35 mesh	$1.00
Nickel	$1.15
Nickel-Silver, 5000-lb lots	*54.00-58.30†*
Phosphor-Copper, 5000-lb lots	*66.00*
Copper (atomized) 5000-lb lots	*46.50-55.00*
Solder	7.00*
Silicon	70.00*
Stainless Steel, 304	$89.00*
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots 20.70-33.90‡	
Tungsten: Carbon reduced, 98.8% min, minus 65 mesh	Dollars nom**
Chromium electrolytic 99.8% Cr, min, metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven foundry Coke

Birmingham, oven	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes*	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.18	....	$6.13	$6.04	$6.41
Bar Size Angles	6.18	....	6.13	6.04	6.41
Structural Angles	6.03	....	5.98	5.88	6.28
I-Beams	6.03	....	5.98	5.88	6.28
Channels	6.03	....	5.98	5.88	6.28
Plates (basic bessemer)	5.95	....	5.90	5.80	6.20
Sheets, H.R.	9.00	....	8.95	8.85	9.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.90	....	9.85	9.75	10.25
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	10.05	....	10.00	9.90	10.30
Sheets, C.R. (drawing quality)	10.00	....	10.95	10.85	11.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	....	25.28	24.99	26.68
Barbed Wire (†)	8.00	....	7.95	7.85	8.25
Merchant Bars	6.18	....	6.13	6.04	6.41
Hot-Rolled Bands	8.90	....	8.85	8.75	9.15
Wire Rods, Thomas Commercial No. 5	6.40	....	6.40	6.25	6.60
Wire Rods, O. H.	6.90	....	6.90	6.75	7.10
Bright Common Wire Nails (‡)	8.40	....	8.45	8.35	8.75

*Books closed for 1959-60 shipping season. †Per 82 lb net reel. ‡Per 100-kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene one deg (deld. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.6f for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%. Carload, lump, bulk, max 0.07% C 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.
Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr. 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr. **Low-Carbon Ferrochrome:** Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W.Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3⅛ lb and containing 2 lb of Mn and approx ⅛ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c; 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ⅛ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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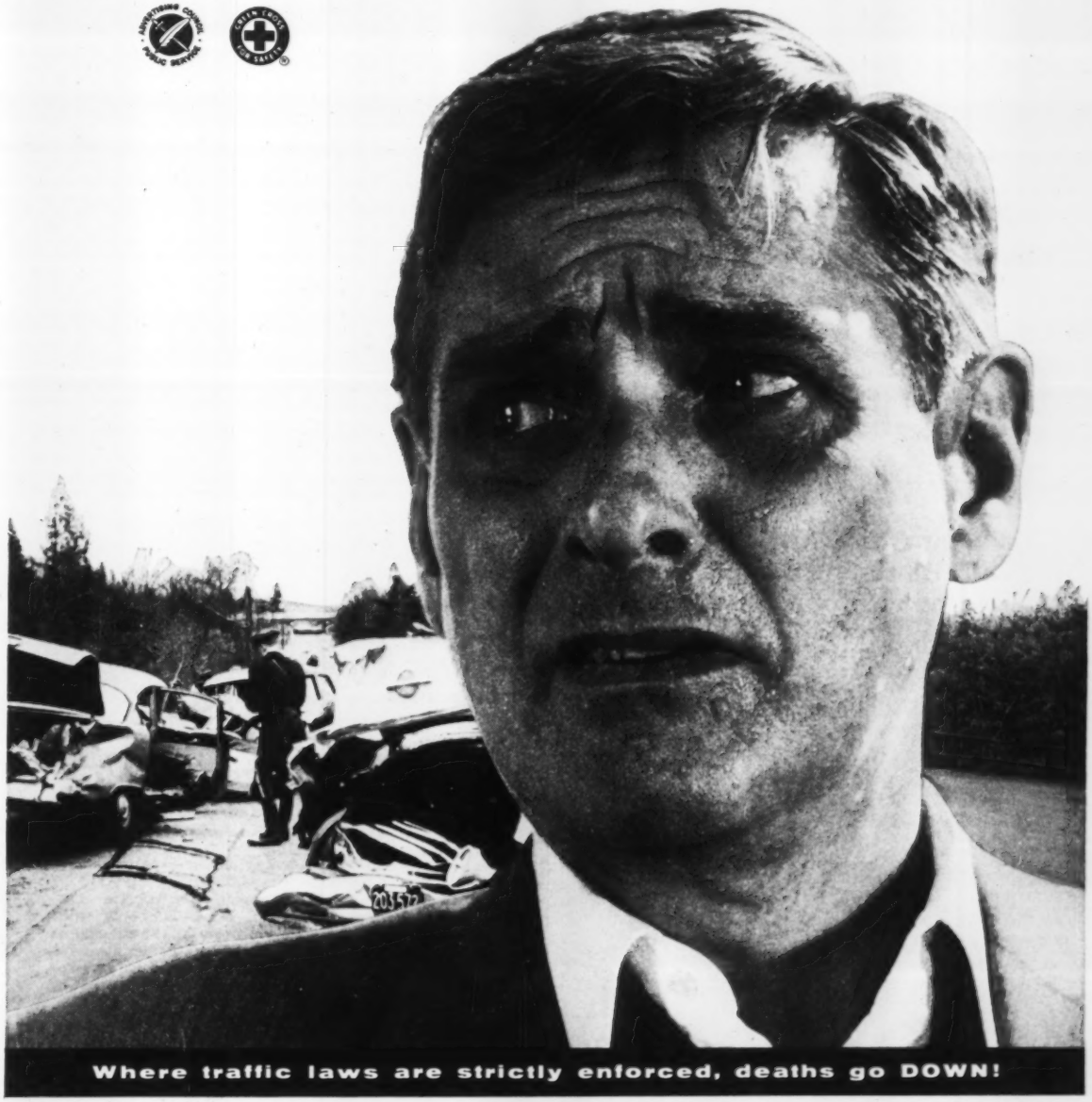

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Scrap Index Resumes Upswing

STEEL's composite on No. 1 heavy melting steel advances $1 a ton to $45.33 after holding unchanged for three straight weeks. Poststrike pickup in mill buying is expected

Scrap Prices, Page 216

• **Chicago**—Except for a few top steelmaking grades, the scrap market is being held in check shipmentwise and pricewise. The only new development here is the acceptance of broker bids by an autobody plant for its November output of No. 1 factory bundles ranging from $45.75 to $47.04 a gross ton on track. On a delivered basis, the bids figure out $48.21 to $49.50, from $1 to $2.25 a ton higher than like material brought a month ago. A second auto stamping plant took no bids because it is closed down for lack of steel.

• **Pittsburgh**—Dealers have good reason to be bullish in the light of these developments: 1. A large mill northwest of here agreed to pay $50 a ton for No. 1 heavy melting scrap delivered after the strike. (Local shippers have $5 freight.) 2. Brokers for a mill on the fringe of the district are offering dealers $46 for No. 1 heavy melting (delivered to the customer) and $41 for No. 2 heavy melting. 3. The area's biggest consumer came back into the market, buying No. 2 bundles at $34 ($4 more than it paid last time). They're to be delivered within 45 days of the strike's end.

• **Cleveland** — The market is unchanged, but sentiment is strong here and in the Valley. Dealers and brokers anticipate a buying surge once the mills get back into production. Prices are unchanged, but they're nominal in the absence of a buying test. The foundry grades have been moving, but slackening operations in the auto industry due to steel shortage are bound to adversely affect foundry operations. Some consumers say they can't buy stove plate under $52, which is about $4 above the level recently quoted.

• **Philadelphia**—Prices on No. 1 bundles and No. 1 busheling have been advanced to $48, delivered, and on electric bundles to $49. Structurals and plates are higher at $50, delivered. All other grades are unchanged, but the market is strong, particularly for No. 1 heavy melting, No. 2 heavy melting, and No. 2 bundles for which demand is active on export account.

• **New York**—Reflecting strong foreign demand, brokers' buying prices have been advanced on No. 1 heavy melting steel and No. 1 bundles to $37-$38, and on No. 2 heavy melting to $33-$34. Other grades are steady, except stainless specialties, 18-8 sheets, clips, and solids. They are up $5 a ton to $200-$205.

• **Detroit**—Dealers are bullish on the outlook, but brokers still express uncertainty regarding the

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market trend. Small spot orders following the auto list closings show some strength in the No. 1 grades, but tonnages are too small to indicate the trend later this month.

• **Buffalo**—Local mills haven't put out any feelers for scrap, but the trade is bullish. Yard inventories have been building up steadily, especially the secondary grades.

• **Cincinnati** — The market has turned active; the November buying program of an area mill not affected by the strike is a motivating factor. No. 1 heavy melting is now quoted at $38-$39 by brokers. Other grades are up $1 to $4 a ton in brokers' buying prices. Advances were sharpest on railroad material. Some scrap is moving out of the district by barge.

• **St. Louis**—Prices are unchanged, but while it's possible to buy material at quoted levels, dealers, looking for better prices, are not pressing tonnage on the market. While sentiment is bullish, largely due to an expected pickup in buying after the strikebound mills resume production, elements of weakness are present. The few mills operating can't take all the scrap available, and the longer the strike continues the more chance there is for weakness to appear in the lists.

• **Birmingham**—All segments of the market are strong, with several advances being posted last week. A large local electric furnace is expected to buy shortly and brokers are anticipating another price increase. A railroad list closing last week was at prices $2 or more above the closing at the end of September.

• **Houston** — Increased export demand and new mill purchases for November generated higher prices last week. The Lone Star mill increased its November prices $3 a ton for steel and $4 for bundles.

Broker quotations based on the mill purchase are $42 for No. 1 heavy melting, $40 for No. 2, and $31 for No. 2 bundles on a local basis ($4.10 freight and under).

In Houston, increased export demand generated $1 a ton higher prices for No. 1 steel and $2 for No. 2. Other Gulf port export prices include those at Mobile, Ala., where f.a.s. quotations are pegged at $43.50 for No. 1 steel, $40.50 for No. 2 grade, $30.50 for No. 2 bundles. The Houston prices range $39-$40 for No. 1 steel, $37-$38 for No. 2, and $26.50-$27.50 for No. 2 bundles.

• **Seattle**—The market is unchanged pending reopening of the steel mills. Not much scrap is being generated, but dealers' yards are well stocked.

• **San Francisco** — Prices are unchanged. Scrapmen are getting apprehensive over the long steel strike. Concentration of steel scrap is about at its limit, and dealers will have to start channeling it to consumers soon.

• **Los Angeles**—Dealers hold large stocks of scrap in their yards. No change in the market situation is expected until the steel labor situation is cleared up.

Iron Ore . . .

Iron Ore Prices, Page 211

Steelmakers are almost certain to run short of iron ore supplies before lake shipping gets started next spring. The strike has extended too far for any considerable tonnage to be brought down before the winter freezeup. Some observers think possibly 10 million tons can be brought down by mid-December if the fleet starts moving immediately and weather conditions are favorable this month and next.

There's plenty of scrap around and no shortage this winter is expected. Some mills like to charge half hot metal and half scrap to assure quality steel. So as to not impair quality, they will probably not want to go higher than 55 per cent scrap when plants reopen.

Imports of iron ore in July from 11 countries came to 3,187,857 gross tons, bringing the total for the first seven months of this year to 17,877,924 tons, reports the U. S. Bureau of Mines. Their value: $154,519,474.

The leading foreign supplier during the month was Canada with 46 per cent of the total. Venezuela supplied 38 per cent, and the remaining 16 per cent came from Chile, Brazil, Peru, Liberia, Philippine Islands, Sweden, Denmark, Mexico, and the United Kingdom, in that order.

Exports of iron ore to Canada in July totaled 974,031 tons; to Japan, 44,438 tons; and to other countries, 1744 tons. The seven months' exports to Canada were 1,782,749 tons, and to Japan, 295,227 tons.

Iron Ore Imports

(Gross tons)

Country:	July, 1959	First Seven Months 1959
Brazil	148,380	739,186
British West Africa	.....	38,101
Canada	1,478,646	5,537,062
Chile	171,721	2,069,937
Cuba	.....	1,600
Denmark	147	309
Dominican Republic	.....	50,370
Liberia	41,594	651,935
Mexico	50	77,878
Peru	94,660	1,052,329
Philippine Islands	24,998	49,998
Spain	.....	209
Surinam	.....	2,320
United Kingdom	30	18,927
Sweden	10,617	22,587
Venezuela	1,217,014	7,565,176
Totals	3,187,857	17,877,924

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Nov. 4, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Nov. 4	$45.33
Oct. 28	44.33
Oct. Avg.	44.00
Nov. 1958	41.42
Nov. 1954	33.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*45.00-46.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 dealer bundles	45.00-46.00
No. 2 bundles	*33.00-34.00*
No. 1 busheling	*45.00-46.00*
No. 1 factory bundles	54.00-55.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Cut structurals:	
2 ft and under	51.00-52.00
3 ft and under	50.00-51.00
Heavy turnings	35.00-36.00
Punchings & plate scrap	53.00-54.00
Electric furnace bundles	53.00-54.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	46.00-47.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	47.00-48.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
Rails, 2 ft and under	65.00-66.00
Rails, 18 in. and under	66.00-67.00
Random rails	60.00-61.00
Angles, splice bars	59.00-60.00
Railroad specialties	59.00-60.00
Rails, rerolling	65.00-66.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*46.00-47.00*
No. 1 hvy melt., dealer	*44.00-45.00*
No. 2 hvy melting	*41.00-42.00*
No. 1 factory bundles	*49.00-50.00*
No. 1 dealer bundles	*44.00-45.00*
No. 2 bundles	29.00-30.00
No. 1 busheling, indus.	44.00-45.00
No. 1 busheling, dealer	42.00-43.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	26.00-27.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals, 3 ft	51.00-52.00
Punchings & plate scrap	53.00-54.00

Cast Iron Grades

No. 1 cupola	57.00-58.00
Stove plate	52.00-53.00
Unstripped motor blocks	48.00-49.00
Clean auto cast	63.00-64.00
Drop broken machinery	63.00-64.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00
R.R. malleable	65.00-66.00
Rails, 2 ft and under	*64.00-65.00*
Rails, 18 in. and under	*65.00-66.00*
Angles, splice bars	57.00-58.00
Axles	57.00-58.00
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles, solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	*31.00-32.00*
No. 1 busheling	47.00-48.00
No. 1 bundles	47.00-48.00
No. 2 bundles	29.00-30.00
Machine shop turnings	18.00-19.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	47.00-48.00
Electric furnace bundles	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	*48.00-49.00*

CLEVELAND

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	46.00-47.00
No. 1 bundles	42.00-43.00
No. 2 bundles	26.00-27.00
No. 1 busheling	42.00-43.00
Machine shop turnings	15.00-16.00
Short shovel turnings	21.00-22.00
Mixed borings, turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut foundry steel	41.00-42.00
Cut structurals, plate 2 ft and under	51.00-52.00
Low phos. punchings & plate	43.00-44.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	43.00-44.00

Cast Iron Grades

No. 1 cupola	55.00-56.00
Charging box cast	41.00-42.00
Heavy breakable cast	41.00-42.00
Stove plate	*49.00-50.00*
Unstripped motor blocks	39.00-40.00
Brake shoes	39.00-40.00
Clean auto cast	58.00-59.00
Burnt cast	*49.00-50.00*
Drop broken machinery	*58.00-59.00*

Railroad Scrap

R.R. malleable	*70.00-71.00*
Rails, 2 ft and under	*67.00-68.00*
Rails, 18 in. and under	*68.00-69.00*
Rails, random lengths	*61.00-62.00*
Cast steel	*53.00-54.00*
No. 1 railroad cast	58.50-59.50
Railroad specialties	55.00-56.00
Angles, splice bars	*59.00-60.00*
Rails, rerolling	*74.00-75.00*

Stainless Steel

(Brokers' buying prices: f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	37.00-40.00
No. 2 heavy melting	35.00-38.00
No. 1 bundles	46.50
No. 2 bundles	26.00
No. 1 busheling	46.50
Machine shop turnings	20.00
Short shovel turnings	22.00

Cast Iron Grades

No. 1 cupola	55.00
Charging box cast	46.00
Heavy breakable cast	44.00
Unstripped motor blocks	45.00
Clean auto cast	56.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00
Rails, 18 in. and under	56.00
Rails, random lengths	51.00
Rails, rerolling	65.00
Angles, splice bars	50.00

BIRMINGHAM

No. 1 heavy melting	*36.00†*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*39.00†*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	41.00-42.00
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	27.00-28.00
Bar crops and plate	46.00-47.00
Structurals & plates	*46.00-47.00*
Electric furnace bundles	40.00-41.00
Electric furnace:	
3 ft and under	38.00-39.00
2 ft and under	39.00-40.00

Cast Iron Grades

No. 1 cupola	*54.50-55.00*
Stove plate	*54.50-55.50*
Charging box cast	29.00-30.00
Unstripped motor blocks	*42.00-43.00*
No. 1 wheels	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
Rails, 18 in. and under	*56.00-57.00*
Rails, rerolling	63.00-64.00
Rails, random lengths	*51.00-52.00*
Angles, splice bars	*49.00-50.00*

PHILADELPHIA

No. 1 heavy melting	45.00
No. 2 heavy melting	39.00
No. 1 bundles	*48.00*
No. 2 bundles	29.00
No. 1 busheling	*48.00*
Electric furnace bundles	*49.00*
Mixed borings, turnings	21.00-22.00†
Short shovel turnings	27.00
Machine shop turnings	24.00
Heavy turnings	35.00†
Structurals & plates	*50.00*
Couplers, springs, wheels	50.00
Rail crops, 2 ft & under	66.00-68.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	48.00
Drop broken machinery	54.00
Malleable	68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	21.00-22.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	14.00-15.00
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	35.00-36.00

Stainless Steel

18-8 sheets, clips, solids	*200.00-205.00*
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	51.00-52.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	*28.00-29.00*
No. 1 busheling	*38.00-39.00*
Machine shop turnings	*21.00-22.00*
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*23.00-24.00*
Low phos., 18 in.	49.00-50.00

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Heavy breakable cast	*44.00-45.00*
Charging box cast	*44.00-45.00*
Drop broken machinery	*59.00-60.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00-46.00*
Rails, 18 in. and under	*61.00-62.00*
Rails, random lengths	*54.00-55.00*

HOUSTON

(Exporters' buying prices; f.a.s.)

No 1. heavy melting	*39.00-40.00*
No. 2 heavy melting	*37.00-38.00*
No. 2 bundles	*26.50-27.50*

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00
No. 2 bundles	20.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	*48.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable	35.00
Foundry malleable	43.00-44.00
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	25.50-26.50
No. 1 bundles	*36.00-37.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	12.00-13.00
Short shovel turnings	15.00-16.00
No. 1 cast	*38.00-39.00*
Mixed cupola cast	*37.00-38.00*
No. 1 machinery cast	*40.00-43.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	25.00-26.00
No. 1 bundles	*40.00-41.00*
No. 2 bundles	23.00-24.00
No. 1 busheling	*37.00-38.00*
Machine shop turnings	16.00-17.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	18.00-19.00

Cast Iron Grades

No .1 cupola	46.00-47.00
Stove plate	40.00-41.00
Heavy breakable	40.00-41.00
Unstripped motor blocks	32.00-33.00
Charging box cast	40.00-41.00
Clean auto cast	*53.00-54.00*

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	32.00-33.00
No. 1 bundles	25.00
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1.	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*36.00*
No. 1 bundles	35.00
No. 2 bundles	22.00
Machine shop turnings	18.00
Shovel turnings	20.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT

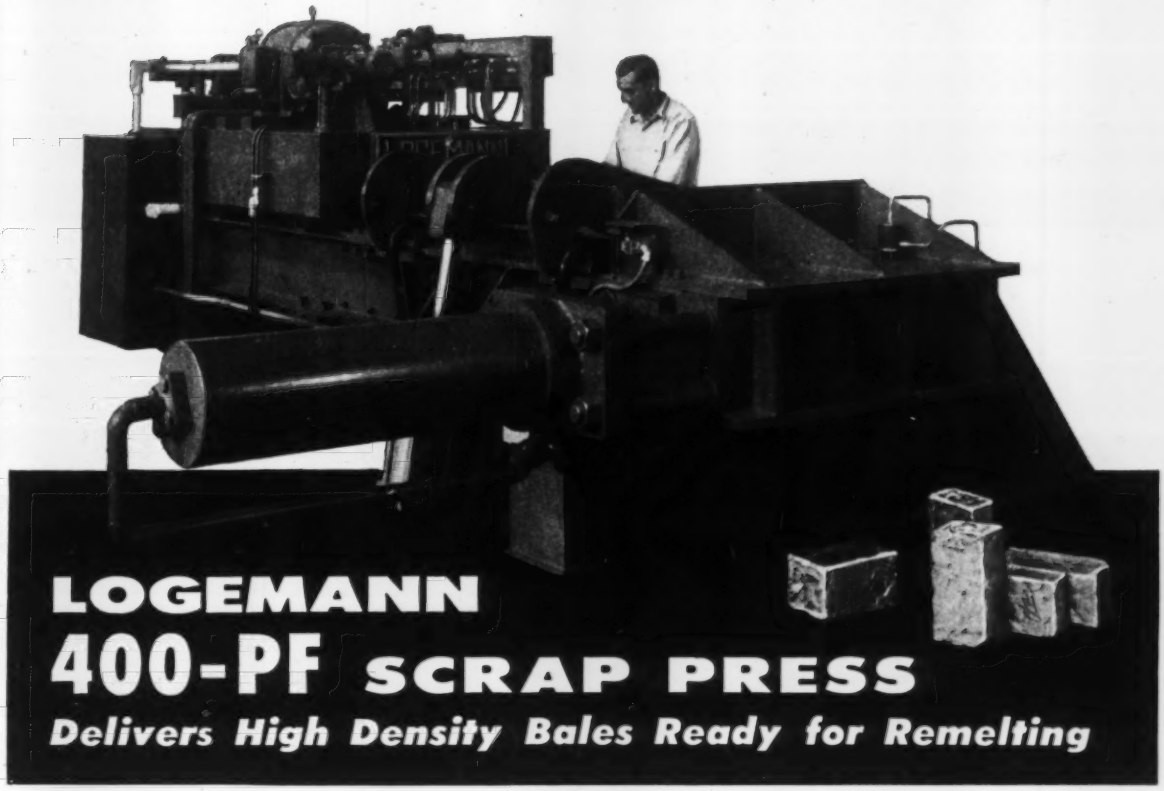
(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

*Delivered to docks.
†Nominal.
‡F.o.b. Hamilton, Ont.



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Top-loading by means of a filling-hopper which can be charged at floor level; a tamper-cover to crush down bulky scrap into the press-box; a charging plate arrangement that permits the hopper to dump a load of scrap into the press while a bale is being made, thus speeding up the production; and the positive discharge of the bale from the bottom. Bottom discharge insures cleaning of the box with each bale, avoiding contamination of bales by foreign matter that might otherwise remain in the press-box.

OPERATION IS ENTIRELY HYDRAULIC

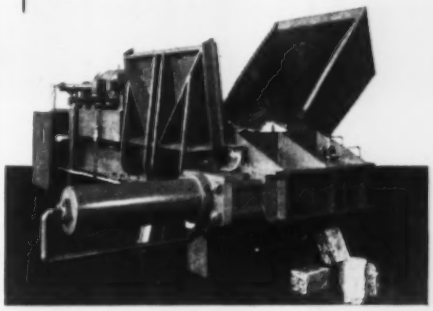
Special valves are controlled by electric switches and relays. To retain flexibility, the hopper and tamper-cover are independently controlled; pressing and bale discharge are automatic, though manual control is also available, when desired.

SPECIFICATIONS

Press-box is 72 inches long, 36 inches wide and 12 inches deep, and the loading area is 60 inches by 36 inches. Bales are 12 inches high, width can be optionally 7, 6, 5 or 4 inches, length varies depending on the character and quantity of scrap charged, which also determines the bale weights. High density is attained through use of powerful hydraulic rams.

OUTPUT

Hourly output is determined by speed of loading. Press operates at high speed; three charges can be in process simultaneously — one in the filling hopper, another on the charging plate, a third under compression.



When writing for complete details, please state the quantity and character of scrap to be baled.

LOGEMANN BROTHERS CO.

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Aluminum Unions May Balk

Kaiser Aluminum has indicated it's ready to negotiate, but the unions don't seem interested. They evidently prefer to wait until Big Steel settles. Output is cut

Nonferrous Metal Prices, Page 220

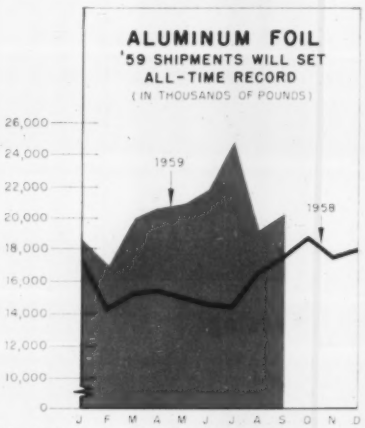
YOU MAY SEE an early labor settlement in the aluminum industry if the unions want to talk turkey.

• **Ready to Settle**—Chairman Edgar F. Kaiser, Kaiser Aluminum & Chemical Corp., has notified top brass of the United Steelworkers of America and Aluminum Workers International Union that he is ready to hammer out a new contract any time they are.

Up to this time, there has been no desire on either side to work out a new agreement. Back in August the major aluminum producers and the unions agreed to indefinitely extend the contract signed in 1956. Both sides were content to sit back and see what happened in steel, which has traditionally set the pattern for aluminum.

On the surface, it looks like the unions would jump at the chance to sign a new package with Kaiser because it would virtually guarantee an industry-wide settlement. While the industry doesn't bargain as a unit, historically the other producers follow the lead of the first one to sign.

• **Going for Broke**—But the facts seem to boil down to this: While Mr. Kaiser may be willing to negotiate, the unions aren't—unless something happens to give them a fast change of heart. It's unofficial, but indications are the USW is not going to bargain with aluminum until it nails down Big Steel. At least some USW brass privately feel: 1. The Kaiser agreement was a mistake because it may have put a ceiling on what the union can eventually hope to win from the rest of the industry. 2. The settlement was not particularly good in view of the length of the strike. The union evidently plans to gamble that it can win a better contract from Big Steel—then pressure the aluminum companies to match the best offer. Only question: Will the AWIU continue to be content to follow the USW's lead? Or will it step out and try to get its own contract?



Source: Aluminum Association

But the unions may not find the industry as tractable this year as in the past. Mr. Kaiser believes his steel settlement is too high for aluminum. "If we were to grant the Kaiser Steel settlement to our aluminum operations, it would result in added cost of 1 cent a pound," he told STEEL.

Aluminum people unanimously think the price of metal is too low. Prices were cut 2 cents a pound in April, 1958. An increase of 0.7 cent a pound went into effect in August, 1958, but it didn't quite compensate for a cost of living increase that became effective at that time. So as far as costs are concerned, the base price is still 2 cents under what it was 19 months ago.

• **Price Pattern**—If aluminum were to sign a contract similar to the Kaiser Steel settlement, it would mean, in effect, a price 3 cents a pound under what it was in April, 1958. But few aluminum men think that they could push through a 3 cent hike. The feeling is that the giant Canadian producer, Aluminium Ltd. (which sells ingots to independent fabricators in this country), would refuse to go along. Domestic producers would have to backtrack. More likely: A price increase slightly in excess of what a new labor contract would cost—say in the neighborhood of 1.5 cents a pound.

• **Output Down**—Make no mistake that the aluminum industry is determined to boost its charges as soon as the labor air clears up. Besides the higher costs facing aluminum management, they've been hit by a sharp loss in business as more and more of their customers have had to curtail or suspend operations due to a lack of steel. Most significant indication: Domestic primary production has been cut back to an annual rate of 1,944,000 tons. Only recently the industry was operating at a pace of 2,123,000 tons a year.

NONFERROUS PRICE RECORD

	Nov. 4 Price	Last Change	Previous Price	Oct. Avg	Sept. Avg	Nov., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	30.75	Oct. 23, 1959	31.50	31.278	31.500	29.415
Lead	12.80	Aug. 24, 1959	11.80	12.800	12.800	12.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	101.375	Nov. 2, 1959	101.50	102.231	102.440	99.034
Zinc	12.50	Nov. 2, 1959	12.50-13.00	12.259	11.360	11.386

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.40 per lb deld.

Cobalt: 99+%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 30.00-31.50 deld.; custom smelters, nom.; lake, 31.50 deld.; fire refined, 29.75-31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $224-226 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $20-22 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 101.375.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $3.00-3.80.

Zinc: Prime western, 12.50; brass special, 12.75; intermediate, 13.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 13.75; special high grade, 14.00 deld. Diecasting alloy ingot No. 3, 15.75; No. 2, 16.25; No. 5, 16.00 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7.00 per lb; over 500 lb, $6.50 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.50; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass, No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.85; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.50-27.00; No. 2 heavy copper and wire, 24.00-24.50; light copper, 22.00-22.50; No. 1 composition red brass, 19.50-19.75; No. 1 composition turnings, 18.00-18.25; new brass clippings, 15.50-15.75; light brass, 12.00-12.25; heavy yellow brass, 13.50-13.75; new brass rod ends, 13.25-13.50; auto radiators, unsweated, 14.75-15.25; cocks and faucets, 15.00-15.50; brass pipe, 15.00-15.50.

Lead: Soft scrap lead, 8.50-9.00; battery plates, 4.25-4.50; linotype and stereotype, 10.00-10.50; electrotype, 8.25-8.75; mixed babbitt, 9.25-9.75.

Monel: Clippings, 30.00-32.00; old sheets 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 4.00-4.50; new diecast scrap, 3.75-4.00; old diecast scrap, 2.25-2.50.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.50-15.00; mixed high copper clips, 12.50-13.00.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 16.75-17.25; segregated high copper clips, 16.00-16.50; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, nom.; No. 2 heavy copper and wire, nom.; light copper 24.00; refinery brass (60% copper) dry copper content, 26.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, nom.; No. 2 heavy copper and wire, nom.; light copper, 24.00; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 16.50; yellow brass turnings, 15.50; radiators, 18.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.40.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 41.00, 2000-5000 lb lots; cast, 43.50, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 119.50; 200-499 lb, 118.00; 500-999 lb, 117.50; 1000 lb or more, 117.00.

Zinc: Balls, 20.00; flat tops, 20.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.40 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.35; 2000-5900 lb, 13.35; 6000-11,900 lb, 13.10; 12,000-22,900 lb, 12.85; 23,000 lb or more, 12.35.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 79.10; 100-600 lb, 69.70; 700-1900 lb, 67.00; 2000-9900 lb, 65.10; 10,000 lb or more, 63.80.

Stannous Chloride (Anhydrous): 25 lb, 154.40; 100 lb, 149.50; 400 lb, 147.10; 800-19,900 lb, 106.20; 20,000 lb or more, 100.10.

Stannous Sulphate: Less than 50 lb, 139.60; 50 lb, 109.60; 100-1900 lb, 107.60; 2000 lb or more, 105.60.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.65	34.21d	49.19	52.06	21.000	20.125	19.125
Low Brass, 80%	51.48	51.42	52.02	54.79	23.500	23.250	22.750
Red Brass, 85%	52.48	52.42	53.02	55.79	24.375	24.125	23.625
Com. Bronze, 90%	54.02	53.96	54.56	57.08	25.250	25.000	24.500
Manganese Bronze	57.00	50.68	61.12	....	19.750	19.500	18.875
Muntz Metal	51.35	46.66	....	....	19.875	19.625	19.125
Naval Brass	53.29	47.10	59.85	56.70	19.625	19.375	18.875
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	64.13	66.46	66.46	....	25.875	25.625	12.812
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	27.375

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

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To promote sales to American End Users of castings and forgings (preferably large) as well as of high carbon and alloy steel products (plates, bars) and stainless steel for chemical equipment. Experienced persons with good personal contacts and knowledge of clientele should send full resume and state income requirements. Box 798, STEEL, Penton Bldg., Cleveland 13, Ohio.

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2 Used Cranes—15 ton capacity hoist—30 ft. lift—38'7" span—wheels to run on 35 lb. rail—3/60/220—AC current. Maximum wheel load 25,000 lbs. 125 ft. minimum trolley speed. 250-300 ft. min. bridge speed—magnetic controls. 25-30 ft. min. hoist speed. Mail complete description and offer to J. A. Graham, The Dayton Steel Foundry Company, P. O. Box 1022, Dayton 1, Ohio.

PRESSES for RENT

$150/Mo. up—No Investment Required
1560 Ton Bliss, 53x72" bed, 24" stroke
800 Ton Hamilton, 41x54", 16" & 32" str.
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ELECTRIC FURNACE MELTER with 24 years experience in melting and handling high grade alloy and stainless steels. Salary open. Age 45. Reply Box 794, STEEL, Penton Bldg., Cleveland 13, Ohio.

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New opportunities in the growing and important field of refractory metals are now available with du Pont at a new facility to be located in Baltimore, Maryland. A major expansion in alloy development, metal manufacture and mill product processing techniques is being conducted. Two supervisory positions are open for men who have from 5 to 10 years' experience in metals processing.

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The position requires the daily supervision of the rolling and finishing areas. The rolling area consists of multi-purpose rolling facilities, unique in design, and capable of very diversified operations. Both hot and cold rolling of sheet, bars and coils of refractory metals will be involved. Experience in finishing, heat-treating and inspection is essential.

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The position requires previous experience in consumable electrode-cold mold-arc melting operations. In addition, thorough knowledge of electrode preparation and the behavior of refractory metals on melting and solidification is required.

Trained personnel in physical and mechanical metallurgy or those with equivalent experience are needed for these supervisory openings. Please forward resume, including details of education, experience and salary expected to **Mr. A. F. Hartford,** Employee Relations Department, **E. I. du Pont de Nemours & Company, Wilmington, Delaware.** Replies held confidential.

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THIS IS THE MAN we are seeking to manage our Mid-East Steel Fabricating Plant:

He must be experienced in all phases of structural steel fabrication methods and costs—

He must be able to handle men—

He must have sterling references as to business ability, stability and character.

Preferably he should have a college education and with an unusual record of job accomplishments.

If you are this man—the only way we will know is to hear from you. Make your resume as complete as possible, including age and pertinent facts which you feel would give you an "edge" over other applicants.

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1 5/16' x 12' 7 3/4" 10,799'
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Technical sales position with large metal company in the heat and corrosion resistant alloy field. Engineering degree preferred. Opportunity includes thorough mill training program. Submit resume with application.

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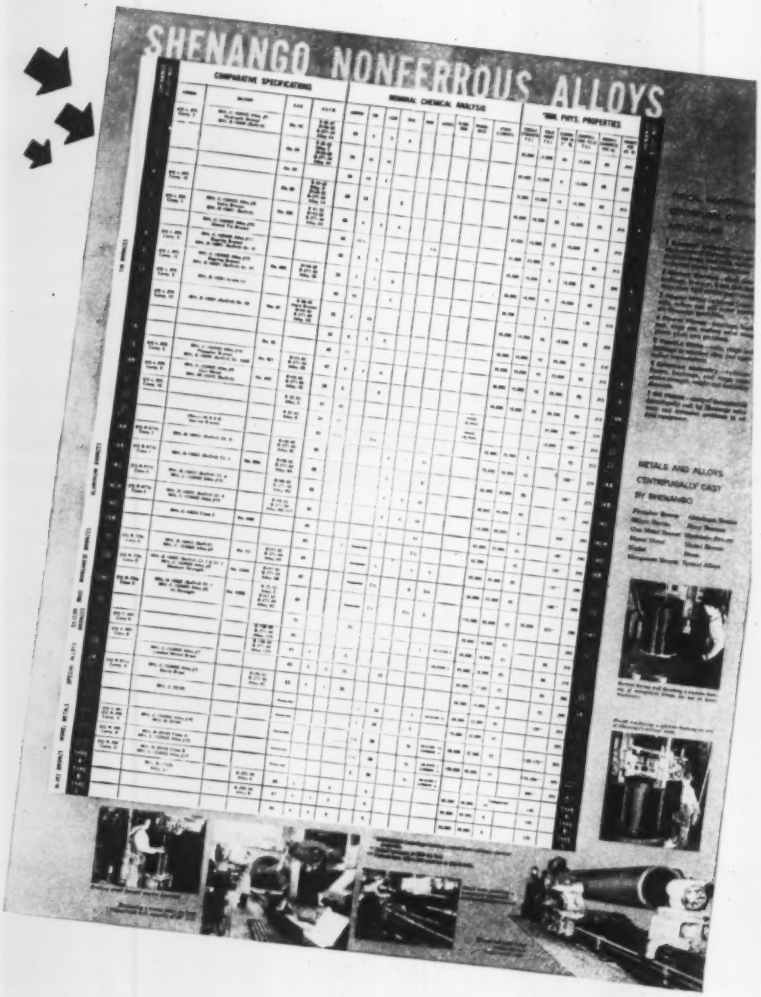

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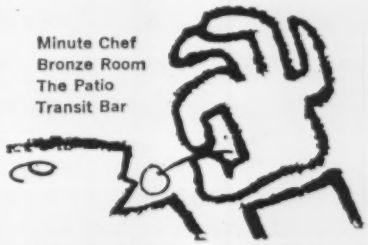

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***Experience**—the added alloy in **Allegheny Ludlum** tool steels*

Careful addition of sulfur to melt guarantees typical sulfide distribution, as shown in photomicrograph of longitudinal specimen of EZ MACHINING tool steel.

Sulfur addition to melt held to narrow range in Allegheny Ludlum's EZ MACHINING GRADES

Uniform, finely-distributed sulfides mean uniform machining, uniform high finish, uniform long tool life order after order

Adding sulfur, actually an impurity, to a tool steel melt to make it free-machining must be done with care and precision. That's why Allegheny Ludlum maintains an extremely close average range in adding sulfur to its EZ MACHINING grades. But mere range, however narrow, is not enough. A-L has developed special techniques in adding sulfur and nucleating agents to produce the uniform, finely-distributed sulfides that characterize good free-machining tool steels.

A-L's extra care means you can standardize your machining operations from piece to piece and order to order. This reproducibility is reflected in uniform *machining;* uniform *high finish;* uniform *long tool life.*

For example, in the production of hobs these machining properties in Allegheny Ludlum's EZ MACHINING steels minimize the costly "backing off" operation for back clearance of multiple teeth, eliminating complicated extra heat treatment. Lower residual stresses are set up, because the steel has a lower resistance to the cutting action. Naturally, hobbing is only one of the situations where these free-machining characteristics can benefit you.

Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier. *ALLEGHENY LUDLUM STEEL CORPORATION, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-23.*

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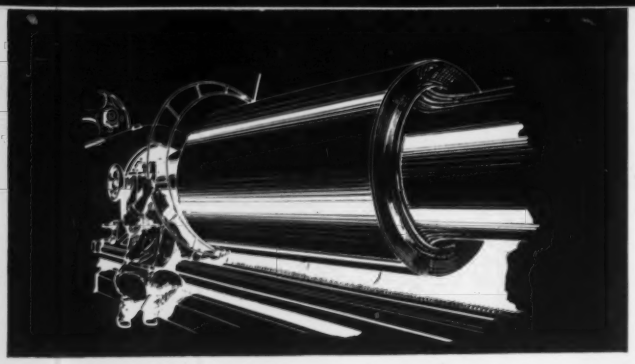

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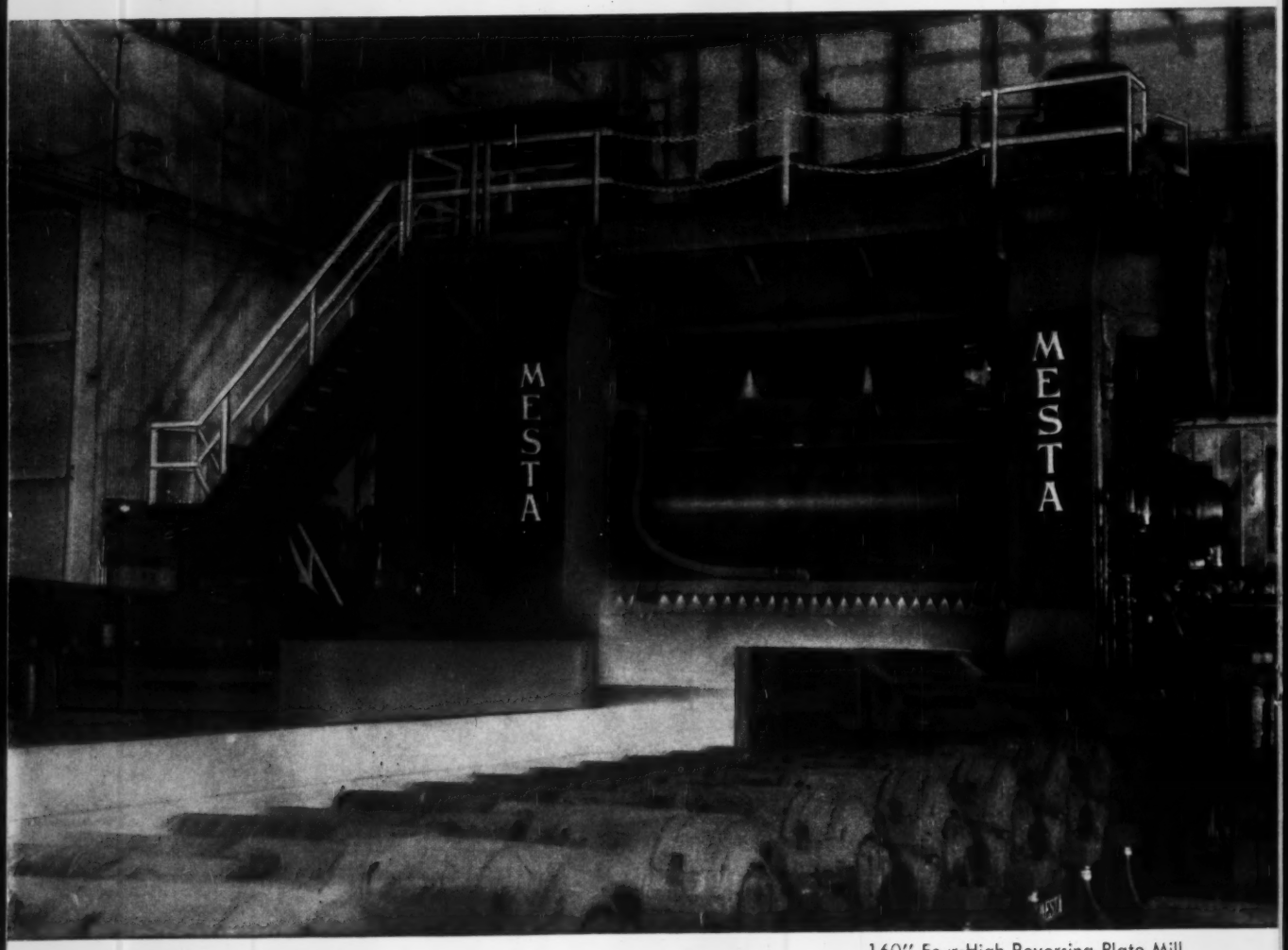

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